



DEPARTMENT OF CITY PLANNING 100 LARKIN STREET • SAN FRANCISCO, CALIFORNIA 94102

SAN FRANCISCO CITY PLANNING COMMISSION

DRAFT ENVIRONMENTAL IMPACT REPORT

SAN FRANCISCO AIRPORT EXPANSION

SAN FRANCISCO INTERNATIONAL AIRPORT

Volume I

EE 73.88

August 10, 1973

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DEPARTMENT OF CITY PLANNING

100 LARKIN STREET · SAN FRANCISCO, CALIFORNIA 94111

August 9, 1973

Dear Sir or Madam:

We are sending you the enclosed draft environmental impact report, and related summaries and transcripts of previous public hearings, for the San Francisco Airport Expansion project. We request that you make these documents available to the general public, and appreciate your assistance in ensuring that wide public distribution occurs.

If you wish further information concerning these materials please contact Mr. Alec Bash of this Department at 558-3056.

Sincerely,

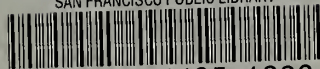
A handwritten signature in dark ink, appearing to read "R. Spencer Steele". The signature is fluid and cursive, with a long horizontal stroke at the end.

R. Spencer Steele
Acting Environmental Review Officer

Enclosure

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ENVIRONMENTAL IMPACT REPORT

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<u>Section</u>	<u>Page</u>
I. Will the Development Interfere with Important Wildlife Breeding, Nesting or Feeding Grounds?	III-9
J. Will the Development Significantly Increase Air or Water Pollution?	III-9
1. Air Quality	III-9
2. Water Quality	III-11
K. Will Development Adversely Affect the Water Table of an Area?	III-12
L. Employment Impact	III-14
M. Utility Services Changes	III-14
1. Water	III-14
2. Sewage	III-14
3. Industrial Waste Disposal	III-15
4. Storm Drains	III-16
5. Natural Gas	III-16
6. Aviation Fuel	III-17
7. Solid Waste Disposal	III-17
8. Electrical Load	III-19
N. Ground Transportation to San Francisco International Airport	III-19
1. External Access	III-19
2. Internal Parking and Access	III-24
3. Rapid Transit	III-25
O. Earthquakes	III-29
P. Tsunami Impacts	III-30
Q. Conservation of Fuel	III-30
R. Fill	III-34
S. Air Freight	III-35
T. Impact on Bay of Air Turbulence	III-35
U. Impact on San Carlos Airport and Half Moon Bay Airports	III-36

<u>Section</u>	<u>Page</u>
V. West of Bayshore Development Impact	III-34
W. Environmental Controls During Construction - Proposed Method of Accomplishment	III-38
IV ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSAL IS IMPLEMENTED	IV-1
V MITIGATION MEASURES PROPOSED TO MINIMIZE THE IMPACT	V-1
VI ALTERNATIVES TO THE PROPOSED PROJECT	VI-1
VII THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	VII-1
VIII ANY IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION, SHOULD IT BE IMPLEMENTED	VIII-1
IX THE GROWTH-INDUCING IMPACT OF THE PROPOSED ACTION	IX-1
X EIR AUTHORS AND CONSULTANTS	X-1
XI WATER QUALITY ASPECTS	XI-1
XII BIBLIOGRAPHY	XII-1

SUMMARY

DRAFT ENVIRONMENTAL IMPACT REPORT
EXPANSION PROGRAM
SAN FRANCISCO INTERNATIONAL AIRPORT

DRAFT ENVIRONMENTAL IMPACT REPORT
EXPANSION PROGRAM
SAN FRANCISCO INTERNATIONAL AIRPORT

SUMMARY

PROJECT DESCRIPTION

The report sets forth the location of the project and the objectives of the program, and gives a summary of its technical, economic and environmental characteristics.

ENVIRONMENTAL SETTING

The present environmental setting is described, including the regional and local settings. The following related projects, planned or under-way, are pointed out:

Completion of Interstate 380 to the Airport
Expansion of Oakland, San Jose and other
Bay Area Airports

The possibility of extending BART from Daly City south on the Peninsula through the Airport is described.

ENVIRONMENTAL IMPACT

The draft EIR discusses the environmental impacts of the project, the following of which are deemed to be of importance:

Noise - The expanded terminal facilities would allow more of the larger and quieter aircraft to operate at the Airport. The number of annual airline operations would not be increased but will be substantially the same as in 1972, due to the capacity of the existing runway system. These factors would reduce noise levels in 1985 below 1972 levels. Also, noise reduction would be experienced in the communities of San Bruno, South San Francisco and Foster City, due to the paving and use of Runway 28R extension and its designation as the primary instrument-landing system runway.

Water Pollution - There would be a major increase in the volume of waste water generated at the Airport. The quality of water in San Francisco Bay, as it may be affected by the effluents from the Airport, will be improved in 1985 over the level existing prior to beginning the Expansion Program, due to the construction of the domestic and industrial waste-treatment plants and the deep water outfall sewer line for treated waste water.

Air Pollution - The air pollutant emissions from aircraft are expected to be less in 1985 than in 1972, due to the limit of aircraft operations and the conversions to newer, more efficient engines developed to reduce emissions.

The more stringent auto emissions standards by the Federal Environmental Protection Agency (EPA) and the State of California will improve the air quality in the Bay Area and in the vicinity of the Airport, even though vehicle traffic at the Airport would almost double.

Ground Traffic - There would be an increase in the volume of auto traffic generated at San Francisco International Airport as the air-passenger traffic grows from 15 million annual passengers to the projected 31 million annual passengers. If the BART system is completed through San Mateo County, the impact of the Airport-generated traffic on the highway facilities would be decreased. The Program is based on 24,000,000 annual passengers utilizing private automobiles and 7,000,000 utilizing mass transit. The vehicular traffic would add to the congestion that would occur at certain points on the freeway system and alternate routes or adjustment in trip schedules may occur. Even without the Expansion Program there would be an increase in the vehicular traffic along the freeways. With the completion of I-380, the traffic on San Bruno Avenue in 1985 is expected to be less than one-third of the present traffic, while the traffic on Millbrae Avenue in 1985 would remain at the level of 1972. These projected impacts are conservative in that they do not assume the extension of the Bay Area Rapid Transit system by 1985. Provisions for the BART extension to the Airport are included in the Program.

Resource Utilitization - Construction of the proposed facilities is expected to consume approximately 117,000 tons of cement; 1,077,000 tons of sand and gravel; 530,000 tons of rock; and 43,000 tons of construction steel. On an annual basis, this is a range of 3 to 18 percent of the annual consumption of these products in San Mateo and San Francisco Counties.

As the designed capacity of the Airport is reached in the 1985 time period, water consumption is expected to increase from approximately 2 million gallons per day presently to 5 million gallons per day; natural gas consumption during winter months is expected to increase from 500,000 cubic feet per hour to 1,300,000 cubic feet per hour; the peak electrical load is expected to increase from the present 18 million volt amperes (mva) to 90 mva; and aviation fuel usage is expected to increase from 225,000 operational gallons per day to 250,000 operational gallons per day as it relates to aircraft serving SFIA. In addition to the above environmental effects, the EIR provides information on earthquakes, tidal waves, fuel conservation, fill, air freight, air turbulence effects on the bay, impact on San Carlos and Half Moon Bay Airports, West of Bayshore development, and environmental controls during construction.

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

One environmental effect which could not be avoided is an increase in vehicle traffic at the Airport and on the roads leading to the Airport.

An increase in the solid and liquid wastes generated is unavoidable. This increase in liquid waste has been anticipated in the design of the sewage-treatment plant and would be incorporated in the industrial waste-treatment plant.

The increase in water, natural gas, electricity, and aviation fuel consumption is unavoidable because these are necessary ingredients for accommodating increased passengers.

MITIGATION MEASURES TO MINIMIZE IMPACT

The Regional Airport Systems Study (RASS) Committee reviewed the overall environmental impact on the San Francisco Bay Area and concluded that expansion of the existing airports to the recommended capacities would most effectively mitigate the regional impact, and that since San Francisco International Airport is already more accessible than the other area airports, it can have an expanded capacity without any land acquisition and with a minimum creation of new land areas.

The proposed San Francisco International Airport Expansion Program, in turn, incorporates a number of measures to mitigate the impact on the local environment:

- The Expansion Program has been designed to take place within existing Airport boundaries so that no land acquisition, with attendant displacement of people, is required.
- The Expansion Program includes facilities that would allow an increased use of the new larger and quieter aircraft. This permits increased passenger traffic without increasing the number of airline operations. This would contribute to reducing noise levels that could otherwise occur.
- The Expansion Program does not include any new runways because the increased passenger traffic can be accommodated on the existing runways. The extension to Runway 28R over existing fill would make the take-off threshold for this heavily-used runway more distant from the communities adjacent to the flight path, thereby permitting improved operations measures and further reducing the noise impact.
- The Expansion Program includes two high-speed exit taxiways which would enable aircraft to leave the runways sooner and at higher speed, thereby allowing them to minimize thrust reversals and still arrive at the loading gates sooner. This would alleviate noise, consume less fuel and, in turn, reduce air pollution.
- The Expansion Program would increase the curbside loading facilities, close-in parking and access and egress for those who choose to use automobiles. There would be improved passenger convenience and less traffic congestion in the terminal areas. These improvements would contribute to the reduction of air pollution from automobile emissions by lessening engine running time in the terminal area.

- Provisions to assist adjacent communities in improving road intersections that join the Airport frontage roads have been recommended for inclusion in the Expansion Program; improvements to the frontage roads themselves have already been included. These improvements would, together with the construction of Interstate 380, help relieve the congestion on the streets of nearby cities.
- The Expansion Program includes facilities for more effective treatment and better handling of both domestic and industrial waste water. These facilities are sized to accommodate the increase quantities anticipated. The projects include a domestic sewage-treatment plant already completed, an industrial waste-treatment plant and collection system, and a joint Airport-South San Francisco deep water outfall. Therefore the quality of effluent entering the bay would not only be improved in quality, but would be more effectively dispersed into deeper waters.
- The Expansion Program calls for provision of modern solid waste collection and compaction systems which would minimize the volume of solid waste being disposed off the Airport site.
- The Expansion Program provides for integrated heating, cooling and electrical systems to give more efficient utilization of fuel and power.
- The Expansion Program is under the architectural and aesthetic control of one firm, so a unified visual effect would be achieved. Budgets of \$2,000,000 and \$850,000 have been established for the art enrichment and landscaping, respectively.
- Small islands to provide protected fish-breeding grounds and rock spits were provided in conjunction with the North Airport Fill project. The plans for this work were approved by the Department of Fish and Game.
- The West of Bayshore Fill significantly reduced the periodic problem of mosquitoes and rodents in that area when it was filled in 1970. Only 50 of the available 180 acres were filled and no other fill is planned for this area. The remaining 130 acres will be preserved as a habitat for other species, such as the garter snake.
- A noise-monitoring program is being implemented so that accurate data will be available to describe aircraft noise. This would aid in implementing noise-reduction programs.
- An air pollutant monitoring system would be included in the Program to maintain a check on the air quality in the immediate vicinity of the Airport.

- o The Expansion Program includes structural provisions for a possible extension of the Bay Area Rapid Transit (BART) System to the Airport. These provisions would make such an extension less costly and less disruptive to on-going operations during construction. If BART is extended to the Airport, it would reduce reliance on the automobile and, hence, reduce the amount of automobile congestion and air pollution.

ALTERNATIVES TO THE PROPOSED DEVELOPMENT

Alternatives discussed in the draft EIR include:

- a. Modify expansion program at San Francisco International Airport
- b. Use of other transportation systems such as rapid rail
- c. Fourteen alternatives studied in the Regional Airport Systems Study (RASS)

The Final RASS report (adopted in the initial Regional Transportation Plan of the Metropolitan Transportation Commission) recommended development of San Francisco to 31 million annual passengers by 1985.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-RANGE PRODUCTIVITY

The short-term uses of the land on which this project is being planned differ only in degree from the long-term uses. The accomplishment of this project would maintain and enhance the long-term productivity of the land by providing facilities which could accommdoate twice the present passenger load.

The entire expansion would be carried out within the present Airport boundaries. Waste water quality would be improved, and provisions would be made to monitor air quality, in order to be able to take corrective action, should this be necessary.

Regarding the human environment, this would be degraded to the extent that more vehicles would be travelling to and from the Airport. In this respect, there is a trade-off between the disadvantages of increased vehicles and the advantages of providing safer, less congested, and

more convenient conditions for air passengers. Neither noise nor pollution from aircraft would increase as a result of the expansion, and monitoring systems are included in the Program to quantify these environmental effects.

IRREVERSIBLE ENVIRONMENTAL CHANGES INVOLVED

Implementation of the Expansion Program will require the expenditure of the following resources:

- o Construction material for buildings and pavement
- o Construction material for building furnishings
- o Energy supplies for heating and cooling buildings
- o Manpower for construction
- o Commitment of capital

GROWTH-INDUCING IMPACT

The proposed Expansion Program is to provide the facilities for air transportation as required by the flying public. Of the 1985 air-passenger demand in the Bay Area projected by RASS, San Francisco International Airport is being designed to handle less than 30 percent of the increase. This increase in capacity would double the present usage of San Francisco International, and would induce population and employment growth in the immediate vicinity.

The Airport Expansion is expected to create approximately 14,000 additional basic jobs by 1985 which, as a secondary effect, would create an additional 17,000 jobs. Population in San Mateo County, due to this additional employment, is expected to increase by 49,000 people who would require 16,000 additional homes. It is estimated that 4,200 acres of residential land and 200 acres of non-residential land would be required in San Mateo County for the increased housing and industrial and commercial growth. If this population increase over the next ten years is distributed throughout the County, it would have a minor effect on the services required, such as police, fire departments,

schools, water supply, sewage systems, etc. However, if a large portion is attracted to one or two communities, there could be substantial demands for services.

SECTION I

Section I

PROJECT DESCRIPTION

A. LOCATION

The San Francisco International Airport (SFIA) is located on the San Francisco Peninsula along the shores of San Francisco Bay. It is 15 miles south of the City of San Francisco, and the communities of Millbrae, South San Francisco, San Bruno and Burlingame are adjacent to the airport property. The SFIA Expansion Program will take place within the existing airport boundaries.

The location and boundaries of the SFIA are shown on Figure 1-1 (enclosed in case in the back of this report) which also shows the existing topography, San Francisco Bay and adjacent cities. Figure 1-2 shows the location of SFIA in relation to the entire Bay region.

B. OBJECTIVES

The objectives of the Expansion Program are to improve the facilities at the SFIA so that it can better serve its role of major transportation hub for the communities in the Bay Area. Currently the Airport serves some 15,000,000 passengers annually. The Airport plans are directed toward providing facilities which will serve a predicted 31,000,000 passengers per year by approximately 1985, while improving the operational efficiency and safety of the Airport and protecting and improving the surrounding environment. It is the intent of this plan that, when this number of passengers is reached, any additional travelers must be accommodated through other airports or by other means of transportation.

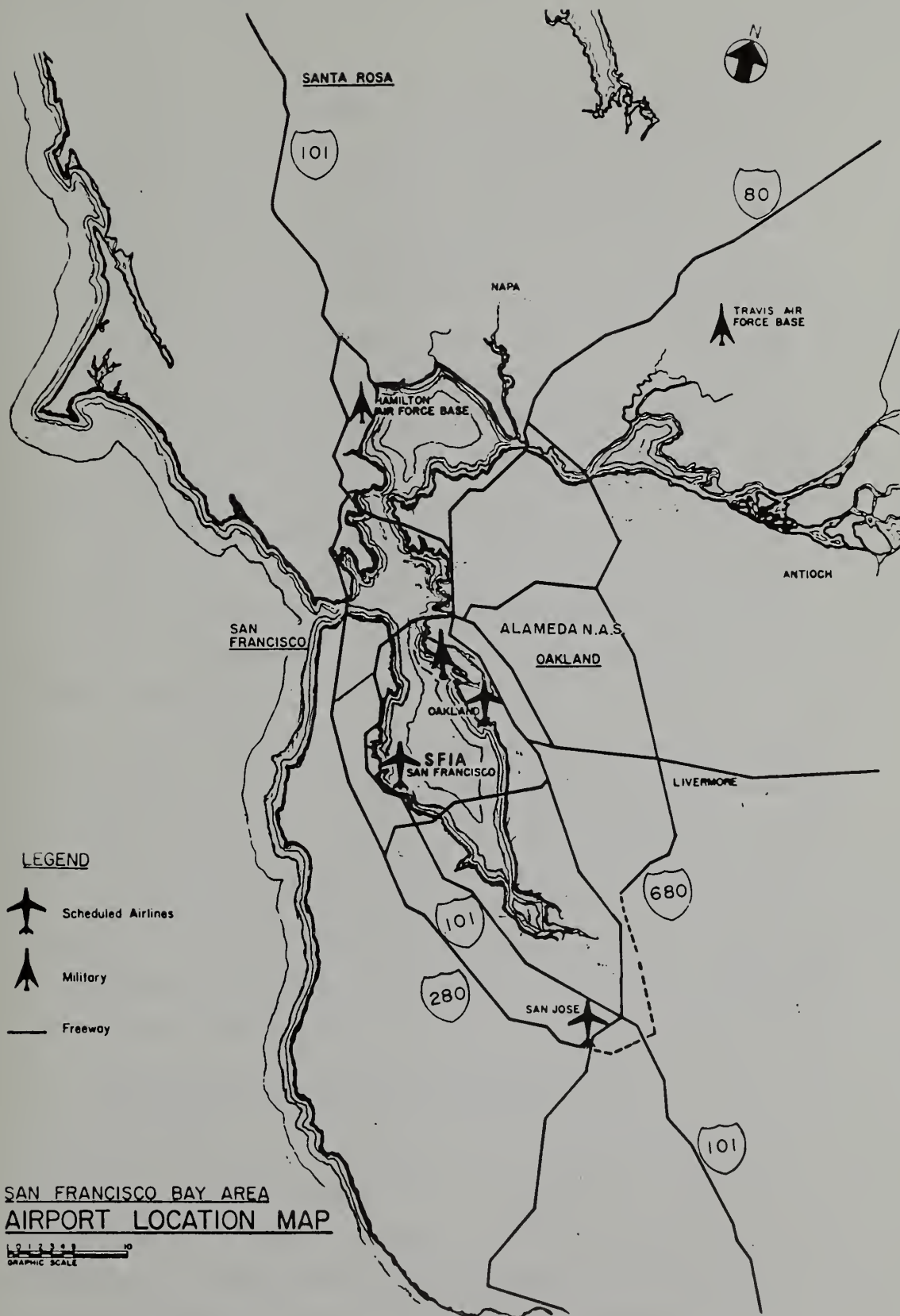


Figure 1-2

The 31,000,000 annual passengers was recommended in the Final Plan, Regional Airport Systems Study, of the Association of Bay Area Governments as the capacity to which SFIA should be planned. This capacity was based on (1) the conservative population forecast for the Bay Area by the California Department of Finance, (2) a constrained passenger growth for the San Francisco Airport for environmental reasons, and (3) the airline seat load factor reaching 60% by 1985. The RASS plan, which envisioned the expansion of San Francisco Airport and other airports, was adopted as a Special Plan Element to the Associations' Regional Plan on November 30, 1972. The Metropolitan Transportation Commission included as a part of their initial Regional Transportation Plan, adopted June 27, 1973, the concept that existing airports be developed to their full capacities. This Expansion Program provides the facilities for the Airport to reach this full capacity under the constraint of staying within existing Airport boundaries and constructing no new runways.

Figures 1-3 and 1-4 show graphically the passenger forecasts of RASS, the Air Transport Association, and the State Department of Aeronautics for the Bay Area and SFIA, respectively. It will be noted that the Bay Area passenger growth to 72 million by 1985 forecast by RASS differs from the ATA and STATE projections by a matter of a few years. It will also be noted that ATA and the STATE forecast that SFIA will reach 31,000,000 annual passengers by 1983 rather than by 1985 as predicted in the Regional Airport Systems Study.

C. SUMMARY OF TECHNICAL, ECONOMIC AND ENVIRONMENTAL CHARACTERISTICS

The principal characteristic of the Expansion Program is that it primarily involves the enlargement and improvement of the terminal area. It provides for an increase in the number of aircraft parking gates from 55 to 80, with 53 of them sized to accommodate the larger jet aircraft. The increase in number of gates is due primarily to the fact that the

PROJECTED GROWTH IN AIR PASSENGERS
BAY AREA REGION

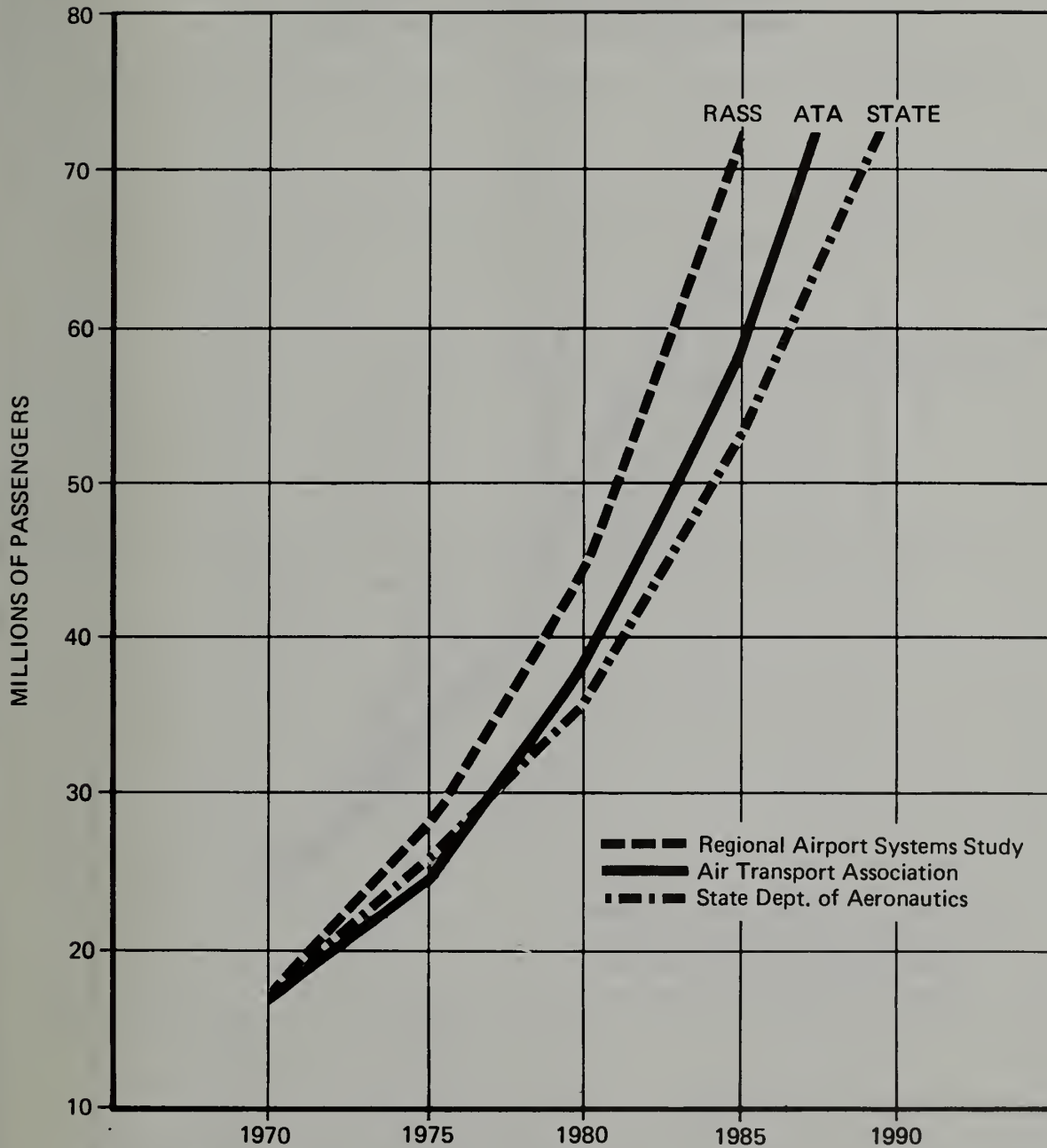


Figure 1 - 3

PROJECTED GROWTH IN AIR PASSENGERS SAN FRANCISCO INTERNATIONAL AIRPORT

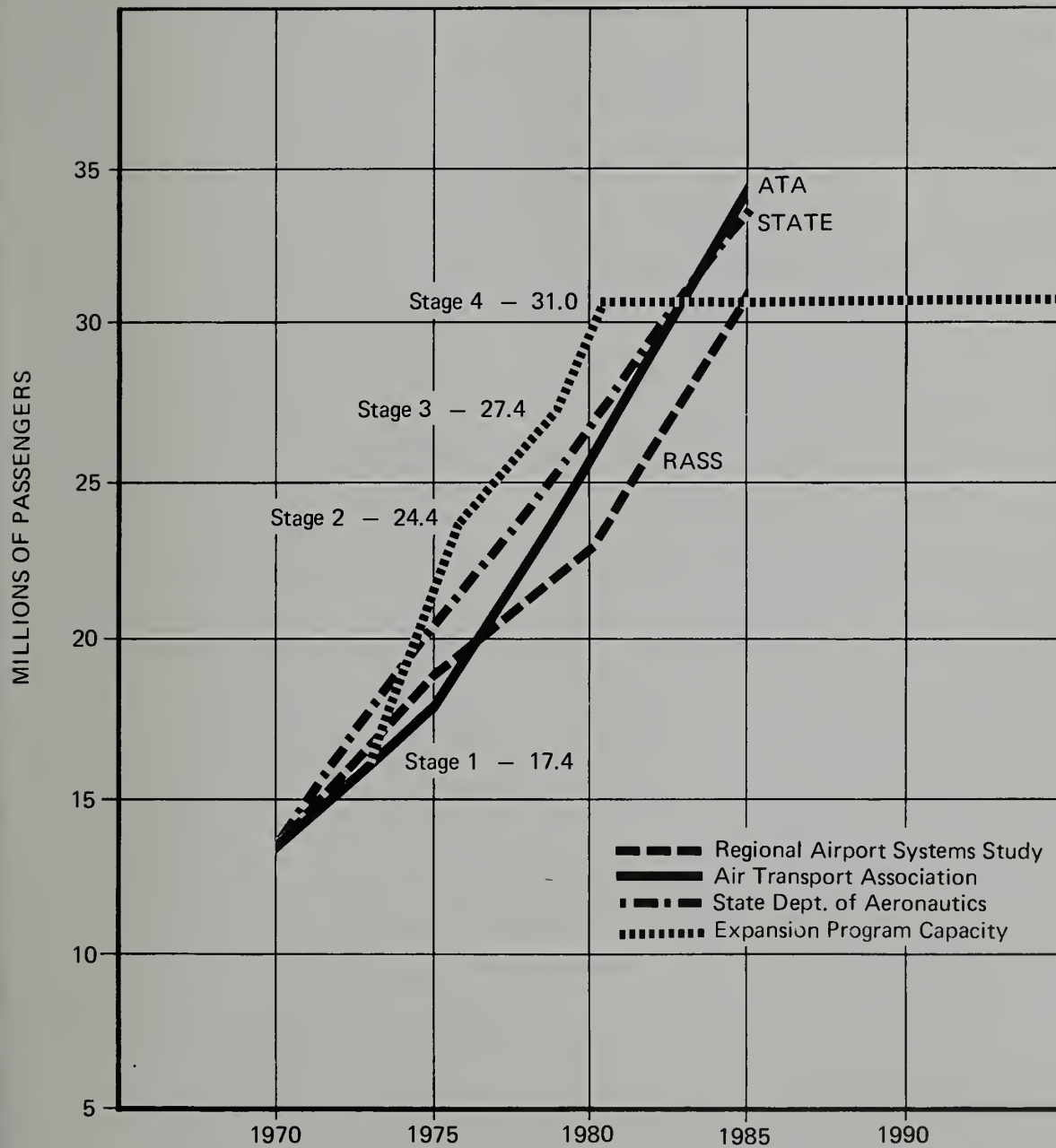


Figure 1 - 4

larger aircraft require about 3 times the gate time of the smaller aircraft, and the fleet mix is changing so that 62% of the daily operations will be with the wide-bodied aircraft in 1985-86, whereas it was less than 6% in 1972.*

The vehicle parking garage at the terminal area would be increased to a capacity of 7,300 from its present capacity of 3,300. Access and service facilities also would be improved.

No additional runways would be provided. However, improvements to existing runways and taxiways are included and the lengthening of runway 28R over existing fill is in process.

The estimated cost of the Expansion Program is \$390,000,000, and would be financed in part by General Obligation Bonds (\$98,000,000) and in part by revenue bonds, operating revenues and Federal Aid (ADAP) funds.

All bonds will be repaid by Airport revenues from the airlines, from the automobile parking lots and from other concessions. The revenue bonds would not be a potential liability on taxpayers. A complete discussion of the financial aspects of the Expansion Program is contained in the document "Financial Feasibility/Rates and Charges Analysis", March 1973.

D. STAGES OF CONSTRUCTION

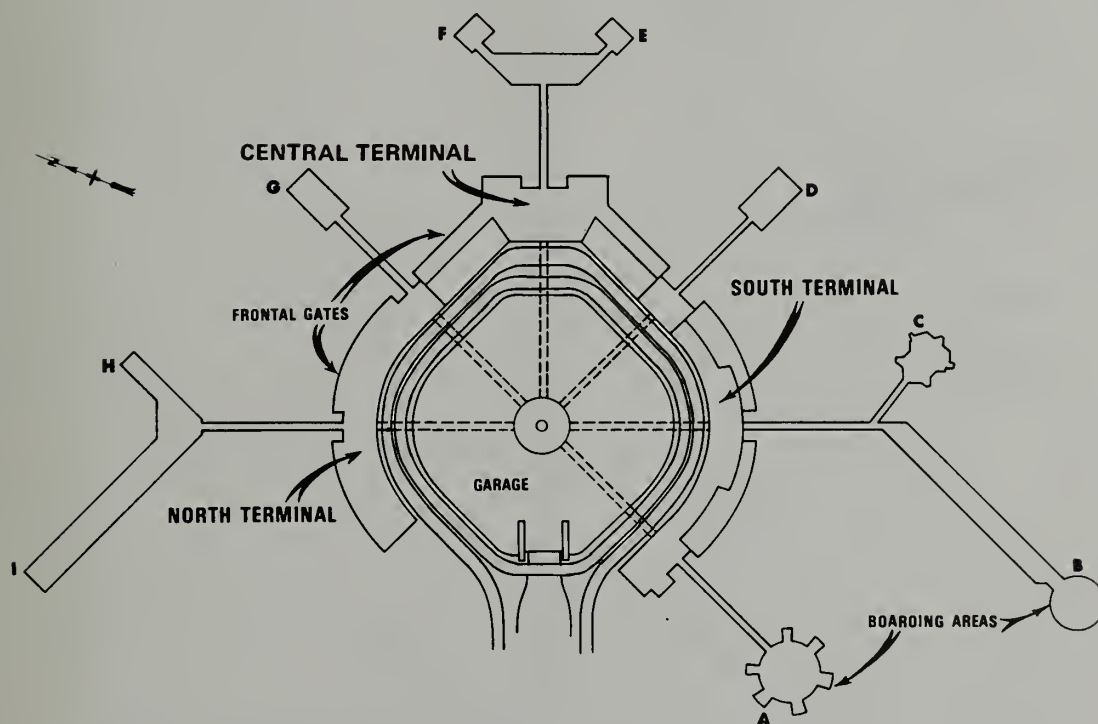
The Expansion Program is planned to be constructed in four stages, related primarily to expansion of passenger facilities. The tentative staging of the development is described below. Should passenger growth not increase as rapidly as predicted, the Airports Commission would evaluate the requirements for the subsequent stages. All of the first stage projects and many of the projects in the other three stages were approved prior to the effective date of the California Environmental Quality Act, November 23, 1970. Construction has been

* R. Dixon Speas & Associates, "Airport Noise Reduction Forecast Program."

initiated on all of the projects in Stage 1 and all but Rotunda A have been completed. Likewise, work has been initiated on projects in Stage 2a. These Stage 1 and 2a projects, which have been completed or are under construction, some of which have had Environmental Impact Statements approved previously by the Federal Aviation Administration as required by the National Environmental Policy Act (NEPA) since federal funds were involved, are included in the proposed Expansion Program to portray the full extent of the work and the total impact on the environment. Appendix A describes the projects as they are tentatively arranged in stages, and where construction has been initiated provides the status of each project. The total Expansion Program in the terminal area is shown in Figure 1-5.

- The first stage, which is largely completed, will provide new boarding areas for international passengers, as well as many airside and landside improvements, including a new sewage treatment plant, with new influent and effluent lines and improved utilities. This stage will be complete by late 1973, with a design level of 17,400,000 annual passengers. See Figures 1-6 and 1-10.
- The second stage as presently planned would provide for completion of a new Terminal with two new remote boarding areas, plus enlargement of the parking facilities in the garage, and will provide additional space in the South Terminal for the international carrier activities. Included in this stage is an industrial waste treatment plant with force mains and pump station, replacement of present sanitary sewers, a deep water outfall for treated wastewater, and stand-by power for the sewage treatment plant. This stage is to be complete by early 1976, with a design level of 24,400,000 passengers annually. See Figures 1-7 and 1-10.
- Stage 3 as presently planned would provide new frontal gates on each side of the present Central Terminal and three remote boarding areas replacing existing ones. This stage is to be complete by 1979, with a design level of 27,400,000 passengers annually. See Figure 1-8.

- In the final stage, the present South Terminal would be enlarged, new frontal gates provided and two remote boarding areas replaced. Completion is planned for 1982, with a design level of 31,000,000 passengers annually. See Figure 1-9.



**SAN FRANCISCO INTERNATIONAL AIRPORT
EXPANSION PROGRAM – TERMINAL AREA**

Figure 1-5

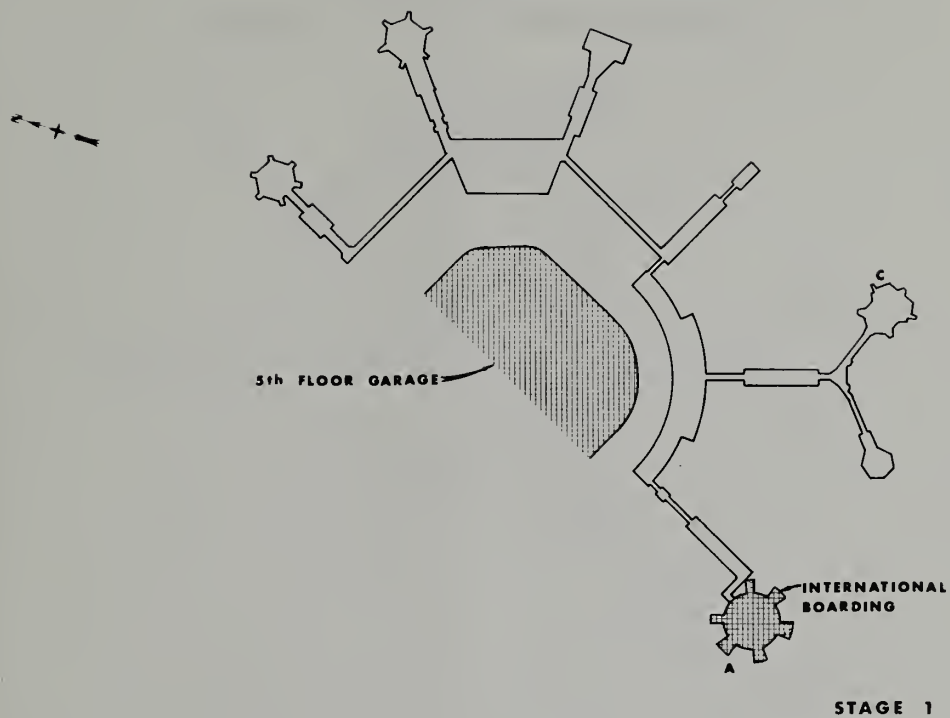


Figure 1-6

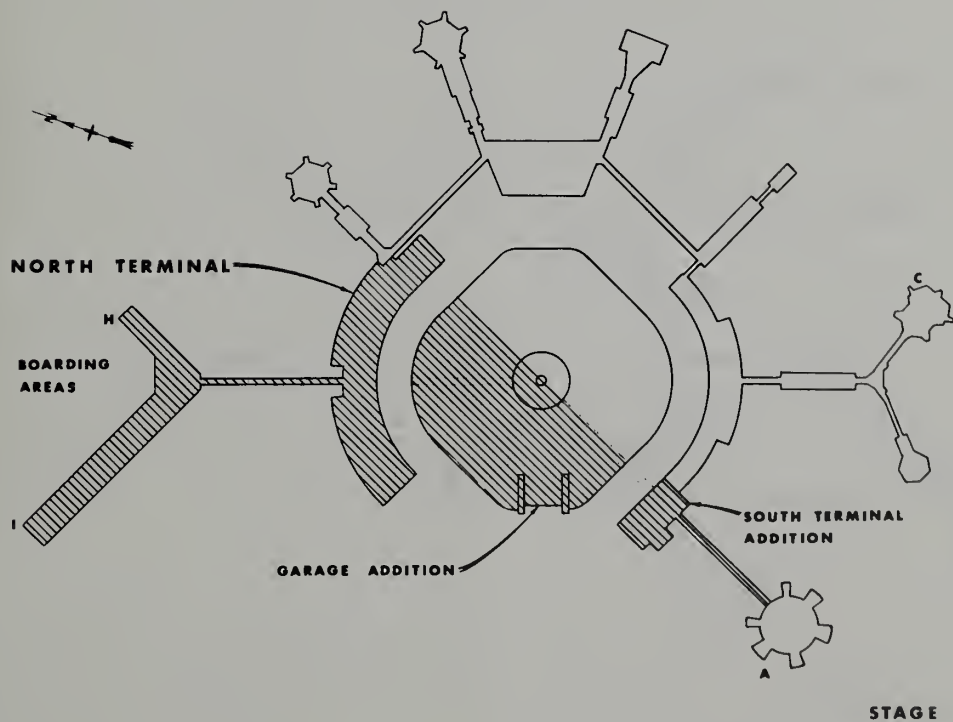
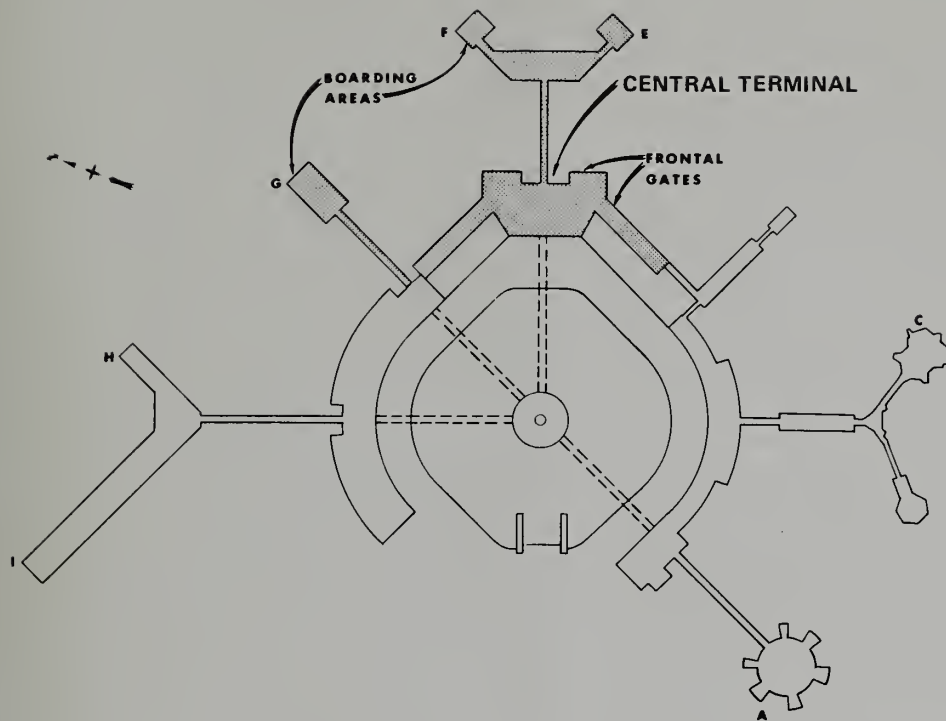
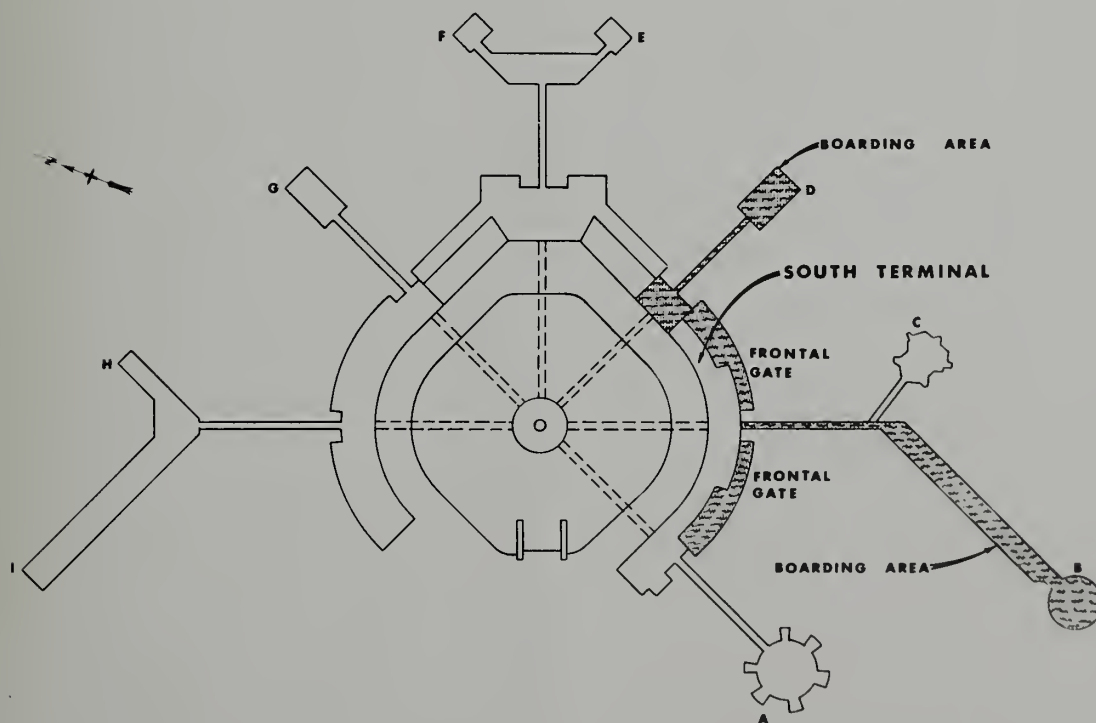


Figure 1-7



STAGE 3

Figure 1-8



STAGE 4

Figure 1-9

SECTION II





Figure 1-11
LANDSIDE PROJECTS

SAN FRANCISCO BAY

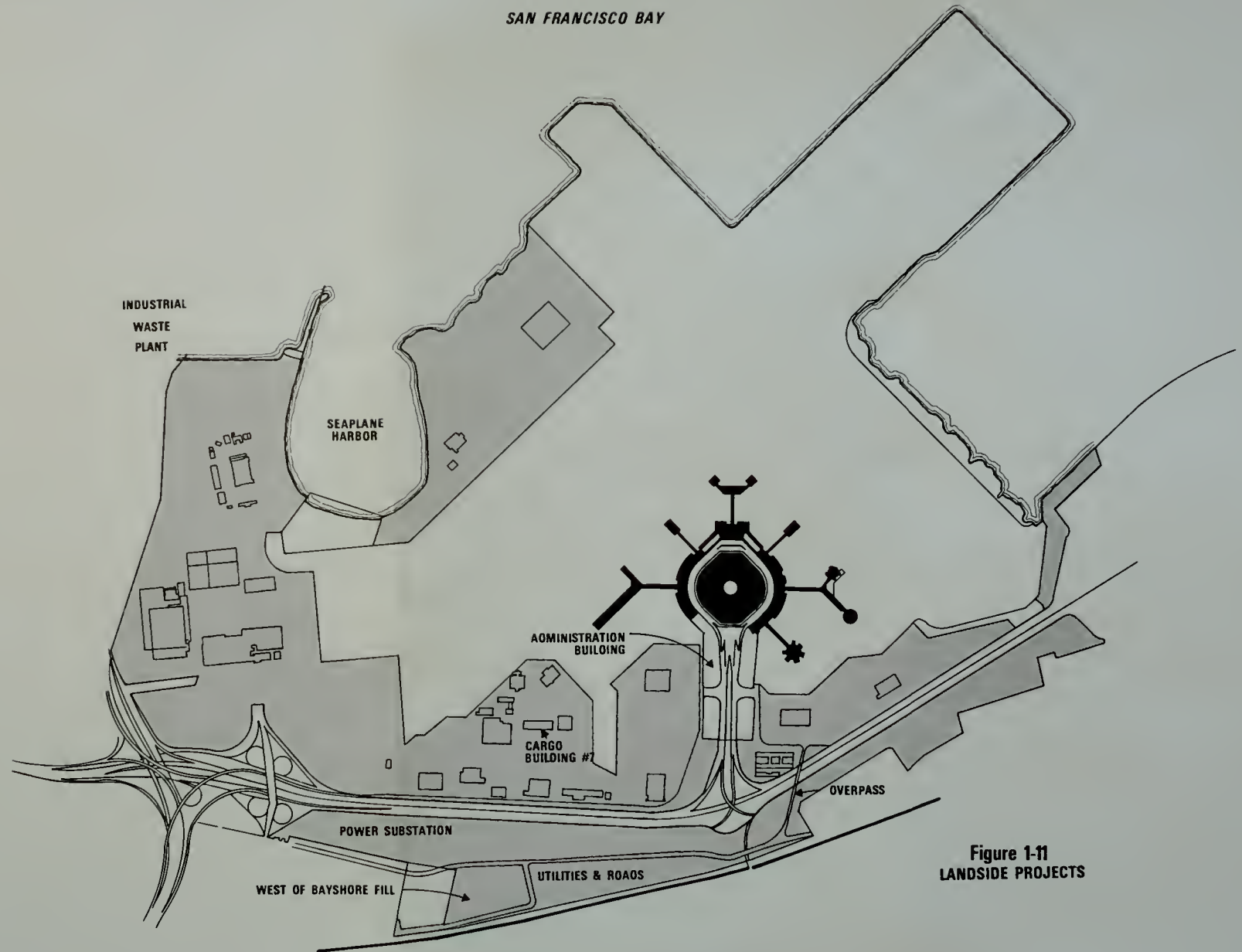
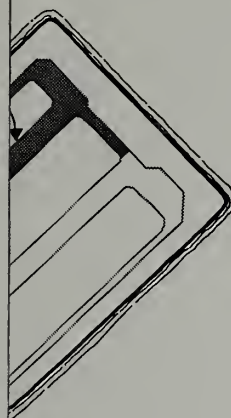
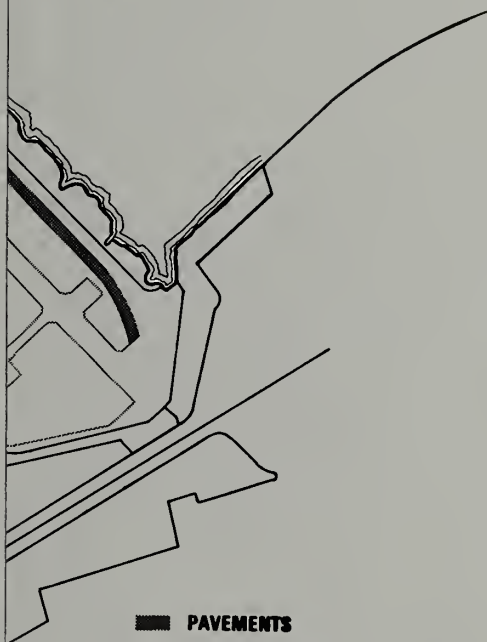


Figure 1-11
LANDSIDE PROJECTS



TAXIWAYS



PAVEMENTS

Figure 1-10
AREA PROJECTS

SAN FRANCISCO BAY

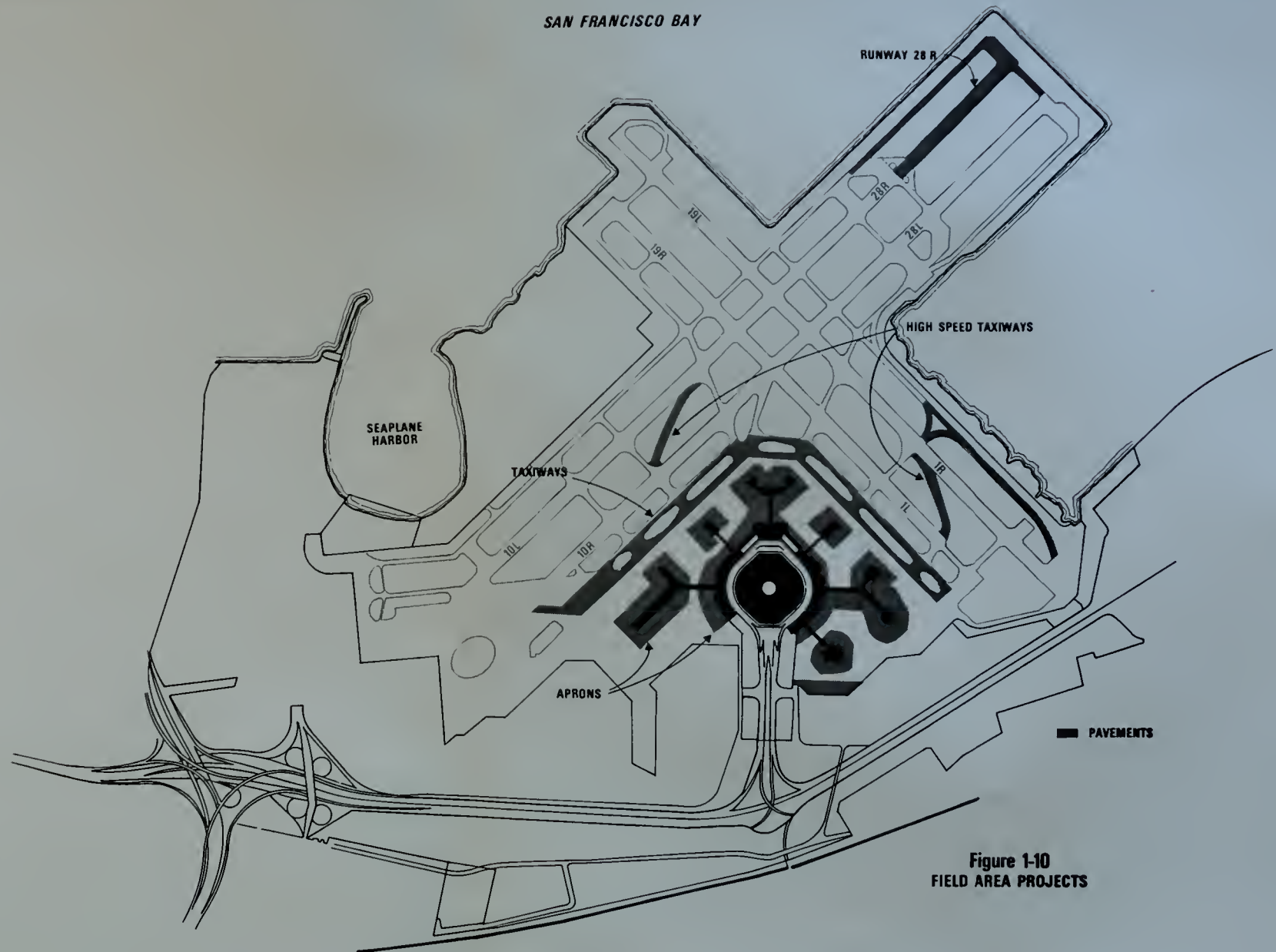


Figure 1-10
FIELD AREA PROJECTS

Section II

ENVIRONMENTAL SETTING

A. REGIONAL ENVIRONMENTAL SETTING

The regional environmental setting in which the project is located consists of a nine-county area surrounding the Bay of San Francisco. Four of these counties border, as well, on the Pacific Ocean. The 450-square-mile San Francisco Bay lies in a valley between ranges of mountains and opens to the Pacific Ocean through a relatively narrow passage at the Golden Gate. Earthquake fault lines traverse the area on each side of the Bay.

San Francisco Bay is a unique body of water that has many diverse uses. The Bay is used for commercial and recreational purposes, such as shipping, fishing and boating, as well as being a breeding ground for several varieties of fish. Shallow waters are immediately east of the Airport. These waters move by tidal action across mud flats and bring water and minerals to plants and fish.

Wild plants and animals abound in the San Francisco Bay region. Over 1,000 different kinds of higher plants and several hundred birds and mammal species are present. If all invertebrates were included, the list of animal species would probably run into the tens of thousands. Animal life in the Bay Area is well diversified. There are many varieties of birds such as pelicans and terns that utilize the Bay. However, because of the long-term commercial and industrial activities at and adjacent to the project location, relatively few of these species are observed today near the project site.

The climate of the coastal areas is tempered by winds from the Pacific and these areas usually have cool summers and warm winters. Snow is nearly unknown in most of the nine counties of the Bay Area. Rainfall varies within the Bay Area, with San Francisco International Airport having an average annual rainfall of 18.69 inches. Between the months of November and March, ground fog conditions occur which close the airport for short periods of time; on an annual basis this totals approximately 72 hours.

In 1970 the population of the area was approximately 4.6 million people residing in the various counties as shown below:

<u>County</u>	<u>Population</u>
Alameda	1,073,184
Contra Costa	555,805
Marin	206,758
San Francisco	715,674
San Mateo	556,601
Santa Clara	1,066,421
Napa	79,140
Solano	171,815
Sonoma	<u>204,855</u>
Total	4,630,253

San Francisco and Oakland are major West Coast sea ports serving the Pacific Ocean basin. The metropolitan areas of San Francisco, Oakland and San Jose are manufacturing centers and San Francisco is the financial center of the West Coast. Much of the nine counties is devoted to agriculture and dairy farming. San Mateo County has a thriving business in cut flowers, while Napa, Sonoma and Santa Clara Counties are famous for their vineyards.

The area is served by major north-south and east-west freeways. The Southern Pacific Railroad serves the San Francisco Peninsula with commuter trains and freight trains. A new 75 mile rapid transit system will serve a portion of the Bay Area local traffic. Lines will run from

Concord and Fremont into Oakland and then across the Bay into San Francisco and on to Daly City. This system may in the future be extended from Daly City down the peninsula. Should this materialize there would be a main line station under the terminal at San Francisco International Airport.

Three commercial airports serve the Bay Area-San Francisco International, Oakland, and San Jose. The majority of the air passengers use the San Francisco airport; in 1972 San Francisco handled 15,500,000 passengers, Oakland 2,080,000, and San Jose 1,886,000. There are 11 key general aviation airfields in the area and 4 military or naval air facilities.

Of the 9,463 tons of pollutants per day from all sources in the nine-county area, aircraft in the Bay Area emitted 138 tons per day in 1970, or less than 1.5%. The state standards for air quality in the Bay Area in 1970 were exceeded on the number of days or times shown in the Appendix E, Table E-9.

B. LOCAL ENVIRONMENTAL SETTING

The water of the San Francisco Bay and the rail lines of the Southern Pacific Railroad for the most part isolate the airport from the surrounding suburban areas. The land environment in the vicinity of the project is a typical one surrounding a major airport that has been in existence over a long period of time. When the Airport first began operations at this site in 1927, it was in a relatively isolated area. Now, over 45 years later, San Francisco International Airport has become the major commercial airport in the Bay Area.

As the Airport grew, so did the surrounding communities, and now land areas adjacent to the Airport include urban developments. Residential areas of Millbrae and San Bruno abut the boundaries of the Airport while the residential areas of South San Francisco and Burlingame are separated from it by commercial and industrial areas

within their city limits. These latter areas, which are immediately north and south of the Airport, house many airport-related commercial and light industrial facilities, including hotels, motels, rental car facilities, flight kitchens and park-and-fly facilities. As shown on Figure 1-1, the Airport is partially surrounded by the San Francisco Bay, has a major north-south freeway crossing its western boundary, with the suburban residential, commercial and industrial areas on its north, west, south and southeast sides.

The Bayshore Freeway, which crosses the airport property, was built as the main north-south traffic route along the San Francisco Peninsula. The bulk of the traffic on the freeway is attributable to the suburban area traffic and the daily commuter traffic between San Francisco and Peninsula cities.

The environment adjacent to the project is governed by its proximity to a very large bay, an existing major airport activity, a heavily travelled freeway, a railroad, and extensive commercial and light industrial development.

The Airport itself is built on a man-made fill varying in thickness from 6 to 21 feet. This fill is supported on soft Bay mud varying in thickness from 19 feet to 60 feet. Bedrock, overlain by various sand and clay deposits, is at depths varying from 62 to 152 feet below the existing ground surface.

Topography creates unique weather conditions near San Francisco Airport. The San Bruno Mountains and the coastal range west of the Airport block out the wind blowing directly off the ocean. These mountains create a funnel effect so that the ocean breezes that do pass over the mountain range provide a fairly constant wind direction from west to east. The Airport is located in an area where the air quality is classified by the Bay Area Air Pollution Control District as transitional between light air pollution potential (some contaminants will be exceeded

occasionally) and moderate air pollution potential (all contaminants will be exceeded occasionally).

Particularly since the introduction of jet-powered aircraft in 1960, the land areas on the south and west sides of the Airport have been and now are affected by the noise created by aircraft operations. Noise-affected areas extend from the Airport to the Pacific Ocean under the take-off flight path from the runways heading 280°, passing over San Bruno, South San Francisco and Daly City. Additionally, the Millbrae and Burlingame areas are affected by take-off and landing noise from runways 1L and 1R. Foster City is affected by noise from aircraft landing on runways 28L and 28R. These noise impact areas have been identified in the San Mateo County Interim Land Use Plan and appropriate uses of these areas are set forth. Noise contours are shown on Figure 3-1, page III-5.

The following communities are in the vicinity of the Airport:

<u>Community</u>	<u>1970 Population</u>
Brisbane	3,003
Burlingame	27,320
Daly City	66,922
Foster City	9,522
Hillsborough	8,753
Millbrae	20,920
San Bruno	36,254
San Mateo	78,991
South Francisco	46,646

San Francisco International Airport is a major existing airport in a large urban area and serves a major air transportation demand. This is truly a regional airport with the zone of influence covering most of Northern California and extending into Nevada.

C. RELATED PROJECTS

Related projects that are either planned or under construction in the area include:

1. Completion of Interstate 380 to Airport.
See Figure 3-3, page III-21.
2. Expansion of Oakland, San Jose and other
Bay Area Airports.

Interstate 380 will have an interchange at South Airport Boulevard just north of San Bruno Avenue and the airport maintenance area. Traffic from the maintenance area and the cargo area, east thereof, will have easy access to this freeway. The completion of Interstate 380 directly to the Airport will divert some of the Airport vehicular traffic from Highway 101 to Route 280 and relieve congestion on Highway 101. The use of Interstate 380 will also reduce the traffic on San Bruno Avenue, on the section between Highway 101 and Interstate 280, to the point where in 1985 it will be only a third of its present traffic, and will prevent an increase of traffic, through 1985, on Millbrae Avenue.

It was recommended in the Regional Airport System Study that Oakland Airport be expanded to be able to handle 24,000,000 annual passengers by 1985, San Jose Airport be expanded to take 10,000,000, the military field of Travis Air Force Base be used jointly as a civilian-military field and take 6,000,000, and Hamilton Air Force Base or Napa County be developed to take 1,000,000. Planning towards these goals has been carried out by Oakland and San Jose but neither has reached the point of design of the necessary facilities. The master plan for Oakland Airport is scheduled to be complete by September 1973, and San Jose has held public hearings on the environmental impact of the expansion of their airport. Both projects need to proceed together with San Francisco, in order to meet the predicted needs.

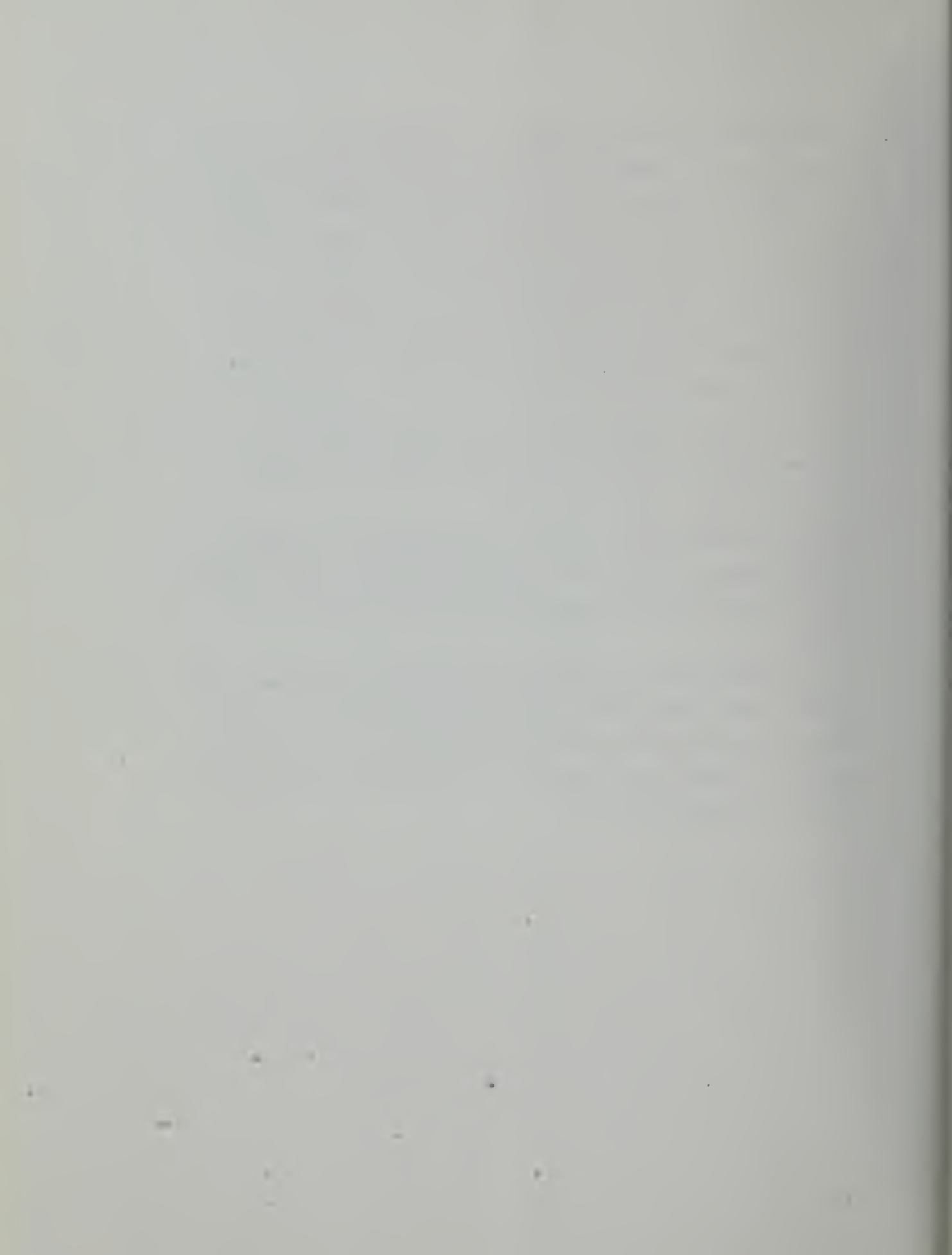
With respect to the recommended plan in the RASS report, the derivation of the "best" aviation alternative was commented on as follows:

"Evolution of this alternative occurred through nearly two-and-one-half years of technical studies on likely aviation, economic, and environmental impacts and requirements under various assumptions, five public hearings, input from many government officials, and many revisions of the preliminary alternatives. The intent throughout was to choose the "best" alternative from a wide range of choices developed through an open process.

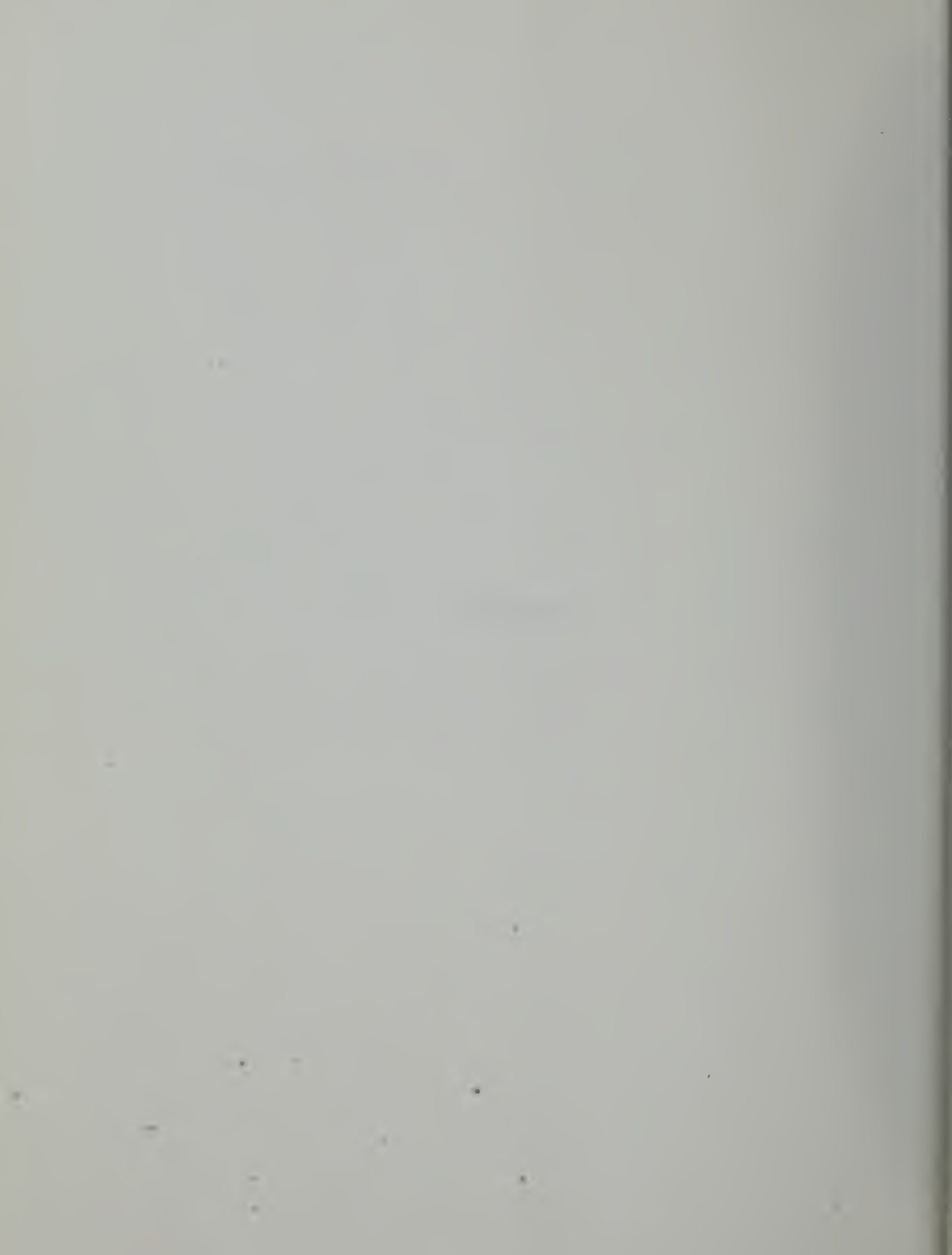
The facilities required to satisfy the allocated demand for passengers was the best estimate that could be forecasted at the time this study was prepared."

The San Mateo County Planning Staff did not indicate any additional airport-expansion-related project developments which, when combined with the airport expansion, would have a cumulative impact on the County.

A possible development is the extension of the Bay Area Rapid Transit (BART) system from the Daly City station direct to the Airport and down the San Francisco Peninsula towards San Jose. Such a development would assist in providing service to both air passengers and commuters now using Highway 101.



SECTION III



Section III

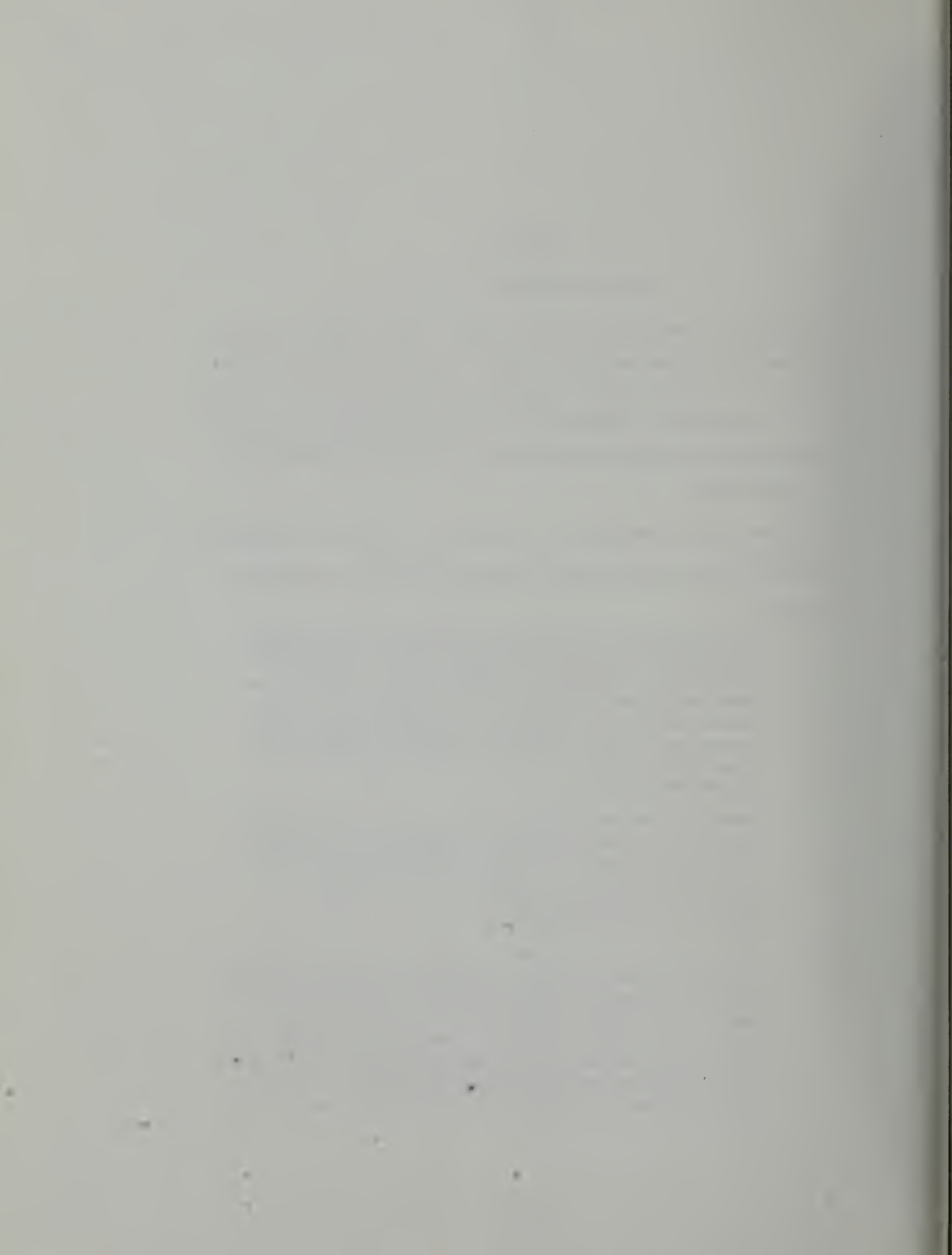
ENVIRONMENTAL IMPACT

The Expansion Program involves a considerable number of projects. Each project by itself may have relatively little impact but the combined total of projects into a complete system may well have a noticeable overall impact. These projects can be viewed as synergistic; the total system impact is greater than the sum of each individual project's impact.

A brief paragraph description of each project is given in Appendix A.

Beneficial impacts of the Airport Expansion Program include the following:

- Terminal facilities would be increased to accommodate the projected number of passengers which would reduce congestion. In Appendix A of this report, there are brief descriptions of the terminal facilities which are planned for the convenience, comfort and safety of the passenger. The new North Terminal presently under construction would provide the single largest amount of congestion relief.
- Roads and parking facilities would be increased to accommodate the increased number of passengers and reduce traffic congestion. Facilities proposed in this Program would increase public parking 71%. Projected peak hour curbspace passenger discharge and pick-up capacity would double by 1985.
- The Expansion Program would result in 53 gate positions for wide-bodied aircraft. This would satisfy the average daily operations of the fleet mix expected in the 1985-86 time period of 34-B 707/DC8, 280-B 727/B737/DC9, 526-B 747/DC 10/L 1011, and 9 others. The 526 operations of the wide-bodied aircraft in this time period compares to only 39 such daily operations in 1972. These larger aircraft are quieter than the smaller ones and the



noise impacts on the surrounding communities will be reduced over what they are at present. If no expansion took place at SFIA to provide for the large addition of wide-bodied aircraft, the noise impacts from aircraft in 1985 would be at least as great as if the expansion had taken place, but many fewer passengers could be accommodated.

- The Program permits greater use of the larger aircraft. Because of air turbulence from these large aircraft, greater spacing between aircraft on take-off and landing is required. This restricts the runway system use to 310,000 annual airline operations. Combined with the conversion to newer, more efficient engines developed to reduce emissions, this restriction is expected to lessen the air pollutants produced by aircraft in 1985 as compared with 1972.
- If Bay Area Rapid Transit (BART) is extended to the Airport, it would reduce the dependence of air passengers on the automobile and, hence, reduce air pollution from motor vehicles. Provision is being made in the Expansion Program for a BART station to be built at a later date, under the Airport Garage in the terminal area.
- The quality of water in San Francisco Bay, as affected by the Airport, would be improved in 1985 over 1972 because an industrial wastewater treatment plant and a deep water outfall sewer line would be provided.
- The extension of Runway 28R, presently under construction, would reduce noise levels for surrounding communities. The extension would move aircraft in take-off one-half mile farther away from residential areas. Also, it would improve the effectiveness of the shoreline departure procedure which is designed to reduce noise levels over residential areas.
- Approximately 30,000 additional long-term jobs would be created.

The adverse impacts of the Expansion Program include the following:

- More water, gas, electrical power, and aviation fuel consumption would be a secondary result.
- More vehicle traffic would be experienced.

- The construction and remodeling would cause varying degrees of interferences with vehicle traffic and passenger movements during the period from the present to 1981.
- The additional employment opportunities would cause additional construction outside of the project area to provide housing, schools and services for the increased population which, in turn, would put open lands into use.

A. Is the Development Controversial?

The development is controversial. The program is, however, in conformance with the Regional Airport Systems Study, the Regional Transportation Plan of the MTC, the California State Department of Aeronautics Alternate Plan C, and the Airport Element of the Bay Area Regional Plan 1970-1990 prepared by the Association of Bay Area Governments.

Public hearings and letters received on the Regional Airports Systems Study (RASS) included the following types of comments:

- No airport expansion in the Bay Region is favored. Increased passengers would be accommodated by higher load factors on aircraft, revised flight schedules or alternate means of transportation.
- Any filling of the Bay for Airport expansion was opposed by some people.
- It was contended that only a small percentage of the population are airplane passengers.
- Some people indicated that they would be willing to choose reduced service for environmental reasons.

A summary of the RASS public hearings is contained in Appendix B.

Three public hearings on the San Francisco Expansion Program were held during March 1973 in San Francisco, Burlingame and Redwood City. Speakers indicated opposition to the Airport expansion based mainly on the following:

- Growth of population in vicinity, with resultant increase in built-up areas



- Noise impact
- Ground traffic
- Air and water pollution
- Bay fill
- Consumption of natural resources

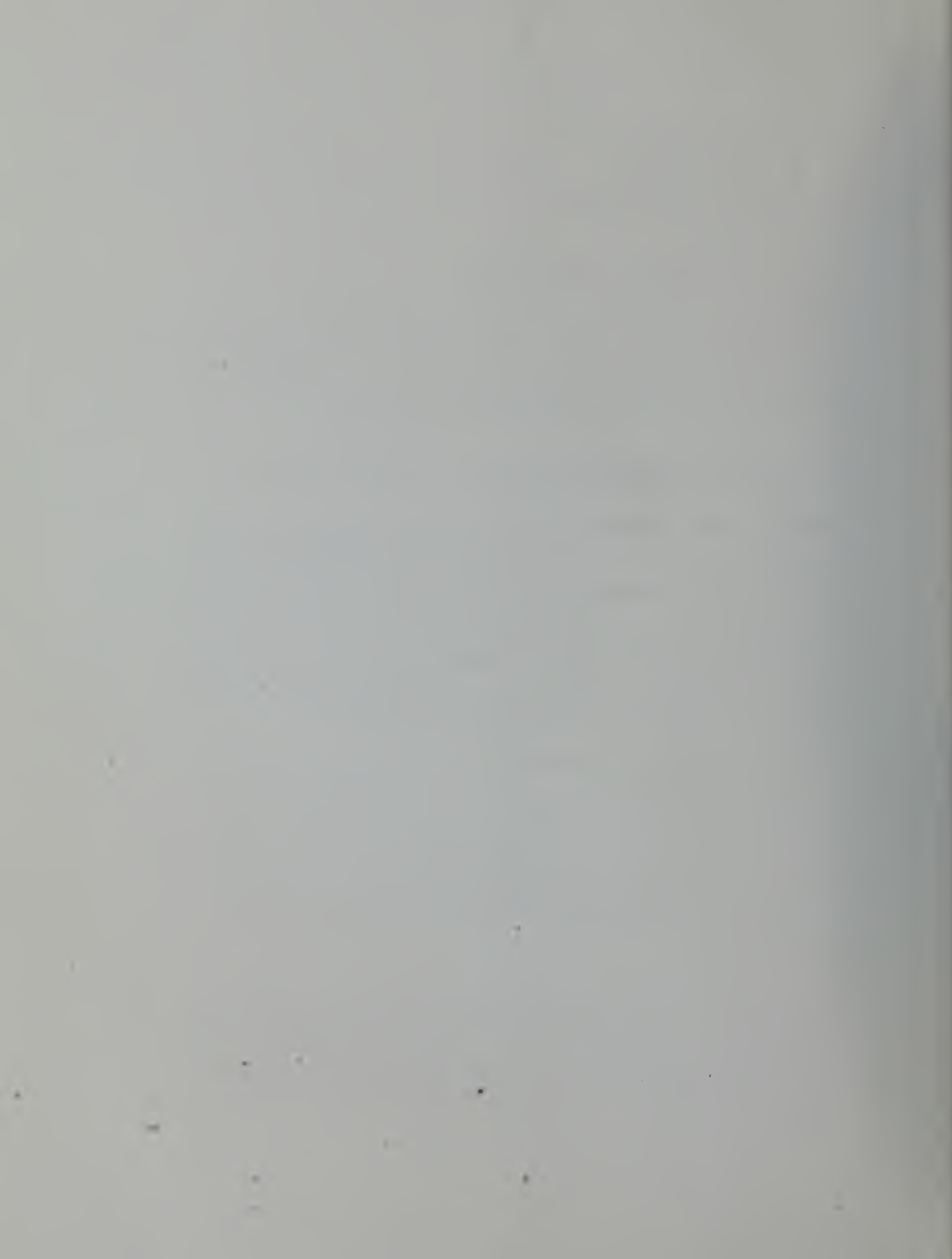
Summaries of these public hearings and the transcripts thereof are on file in the San Francisco Public Library (Main Branch), the San Mateo County Library (Millbrae Branch), the San Francisco Department of City Planning, and the San Mateo Planning Department.

B. Will the Development Noticeably Affect Ambient Noise Levels for a Significant Number of People?

Noise from current operations at SFIA is an environmental factor of concern to many citizens. The question of expansion of the facilities, therefore, introduces concern about the changes in noise environment that would accompany the Airport expansion. This phase of the environmental impact study is concerned with defining, in as quantitative a manner as possible, the changes in noise environment for the proposed expansion as compared to the current noise exposure.

The Expansion Program would enable more of the quieter jet aircraft to use SFIA. By 1985, it is forecast that 62% of the average daily operations would be with wide-bodied aircraft versus less than 6% in 1972. These quieter aircraft, together with the limit on aircraft operations because of spacing requirements due to greater jet turbulence, would mean that the aircraft operations at SFIA would be quieter in 1985 than in 1970.

Recently, there has been put into effect a shoreline noise abatement departure pattern for flights taking off from the runways heading 280° (i.e. Runways 28R and 28L). This has reduced the noise impact on areas in surrounding communities. Figure 3-1 shows the 1972 noise contours.



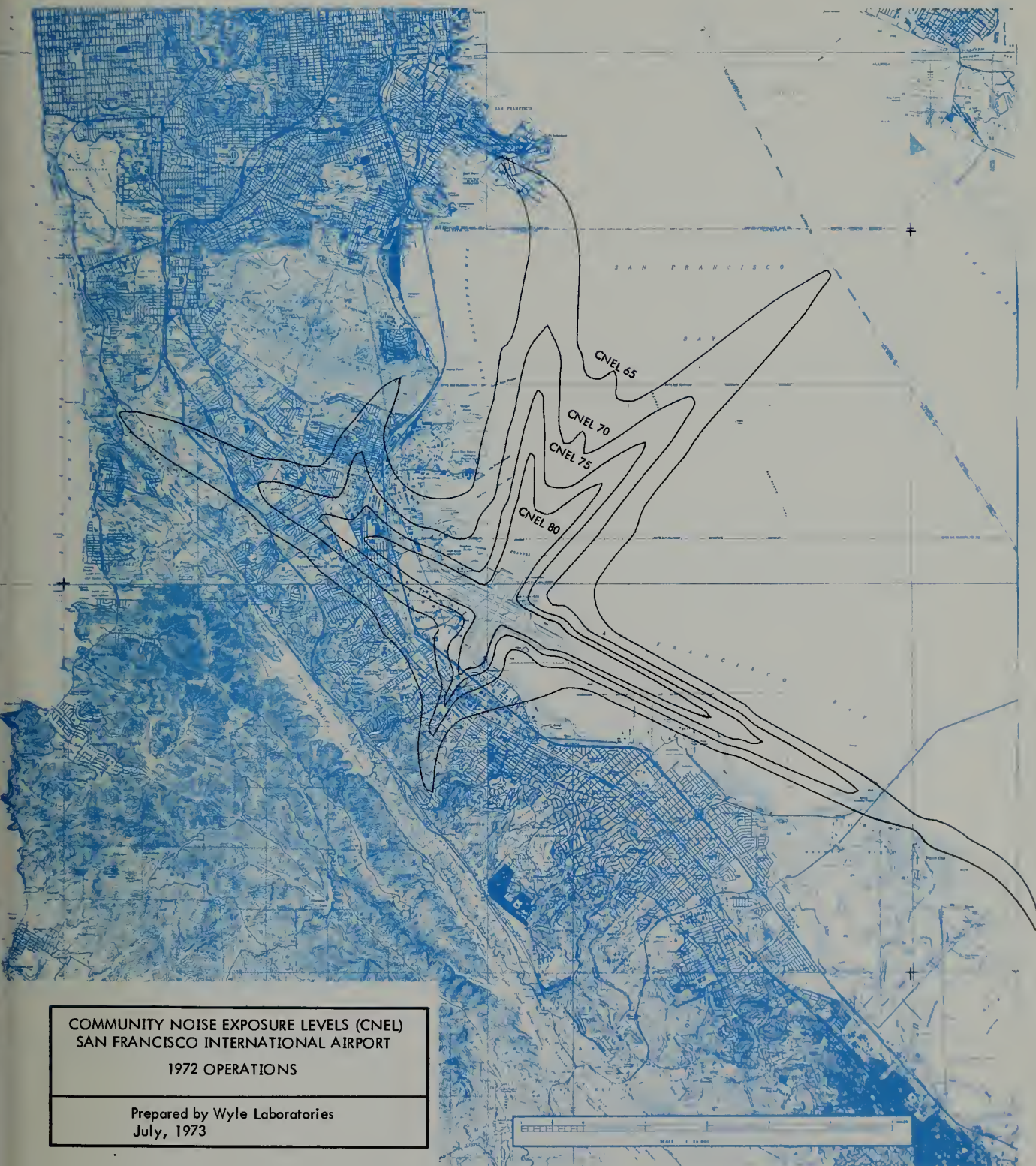


FIGURE 3-1

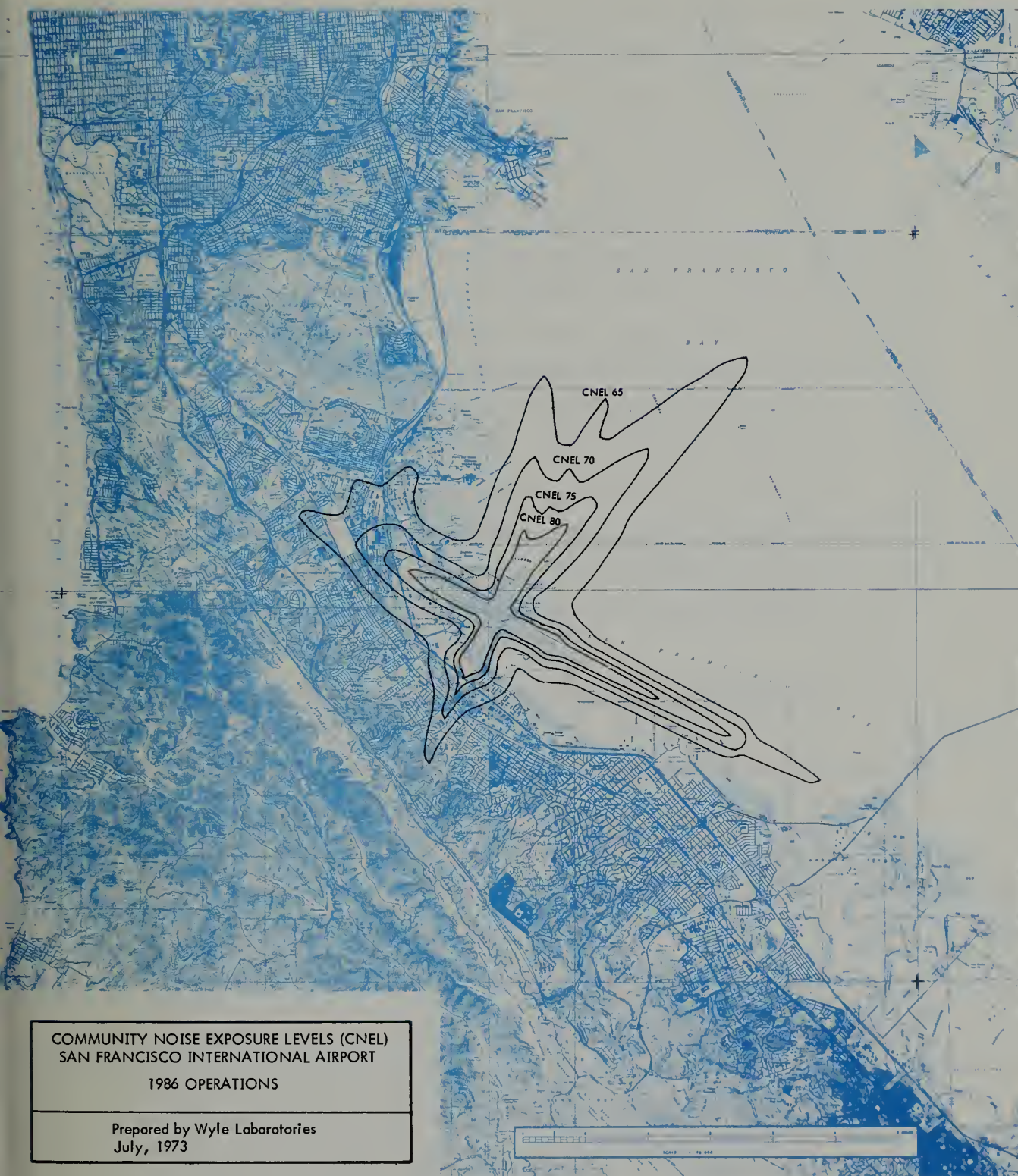


FIGURE 3-2

Predicted noise contours for 1986 were prepared by Wyle Laboratories and are shown on Figure 3-2. This forecast was based on traffic descriptions prepared by R. Dixon Speas & Associates which included arrival and departure frequencies for each of the aircraft types, the traffic distribution during the day/evening/night, runway utilization, flight track assignments, and departure stage lengths.

The noise contours predicted for 1986 indicates that the areas west of Bayshore Freeway which exceed the CNEL 65 noise level (that level considered acceptable for residential areas by State standards) would be reduced to 2.7 square miles as opposed to 8.08 square miles in 1972. By 1985-86, aircraft noise over CNEL 65 would not occur within approximately 1 mile of Foster City. See also Appendix D.

Included as an item in the Expansion Program is a project for the procurement of the necessary equipment to monitor the noise impacts along the take-off and landing patterns. This equipment would be installed and utilized to see that the noise levels set by State and Federal standards are not exceeded.

C. Will the Development Result in Displacement of a Significant Number of People?

The San Francisco International Airport Expansion Program does not involve the displacement or relocation of people. No taking of residential land is contemplated. Cities adjacent to the Airport are providing legal means to minimize land use outside the Airport that may be incompatible with Airport use.

D. Will the Development Have a Significant Aesthetic or Visual Effect?

There would be little aesthetic or visual effect of this expansion from the Airport. Nearby areas which overlook the Airport are at such distances that the improvements in the outward appearances of the facilities would not be evident.

E. Will the Development Divide or Disrupt an Established Community or Divide Existing Uses?

The proposed expansion at San Francisco International Airport would not divide or disrupt an established community or divide existing uses. All the expansion is being accomplished within existing airport boundaries. There would be less disruptive noise in the adjacent communities but there would be more automotive traffic using the freeways.

F. What Will be the Effect on Areas of Unique Interest or Scenic Beauty?

The San Francisco International Airport Expansion Program is being accomplished within the existing airport boundaries. Although it is adjacent to the Bay, which is an area of unique interest and scenic beauty, the project will not impinge upon the Bay.

G. Will the Development Destroy or Derogate Important Recreational Areas?

By 1986 noise impacts on recreational areas would be substantially reduced from the present conditions. Predicted noise contours indicate that only the park in San Bruno on Huntington Avenue would be within the CNEL 65 impact zone. All other parks and golf courses would be in areas where the noise impact is no greater than the State code considers acceptable for residential areas. Also the noise impact over the Bay would be greatly reduced as can be seen by comparing Figures 3-1 with 3-2.

H. Will the Development Substantially Alter the Pattern of Behavior for a Species?

The Expansion Program for San Francisco International Airport would not substantially alter the pattern of behavior for a species. The development is being accomplished on the existing airport in areas that are presently utilized for commercial or industrial airport uses.



I. Will the Development Interfere with Important Wildlife Breeding, Nesting or Feeding Grounds?

The proposed Airport Expansion Plan would not interfere with important wildlife breeding, nesting or feeding grounds. The expansion is being accomplished on existing airport property. The water entering the Bay would be cleaner in 1985 than in 1970 because of improved sewage treatment facilities and waste water treatment facilities. This would enhance the environment for any water life adjacent to the airport.

The area west of Bayshore has been listed as a possible habitat for the San Francisco garter snake. 50 of the 180 acres in this area have been filled and are planned for development. The remaining areas will not be developed and could serve as a habitat for this species.

A clear relationship between wildlife and aircraft noise and operations has not been established, and an evaluation of the impact of the airport expansion on wildlife cannot be made in a quantitative manner. However, it is shown elsewhere in this environmental impact report that air pollution is expected to decrease compared to 1970 levels, noise is expected to be less compared to 1970 levels, and waste discharges would be cleaner compared to 1970 levels; thus, the 1985 environment would be improved over 1970 for wildlife.

J. Will the Development Significantly Increase Air or Water Pollution?

1. Air Quality

The air quality in the vicinity of San Francisco Airport is expected to improve by 1985 over 1970 conditions. In February 1971, the Bay Area Pollution Control District produced a report, Aviation Effect on Air Quality. This report described the existing air quality in the Bay Area in 1970 and the expected air quality in 1975, 1980 and 1985. It calculated the amount of emissions expected from aircraft at each airport in the future years, as well as emissions expected from other sources throughout the nine counties of the Bay Area. The report



indicates that the Airport-related air contaminant emissions for 1985 would decrease to approximately 37 percent of 1970 levels. The marked reduction is due to Environmental Protection Agency (EPA) standards.

The Bay Area Air Pollution Control District prepared a mathematical model for predicting air pollution at specific points in the Bay Area because of operations at SFIA. This model did not show any major differences from present conditions. This model was based on approximately 558,000 annual airport operations, far in excess of the 370,000 annual airport operations, now expected to be the total Airport capacity.

The 370,000 total runway operations would include 310,000 airline, 30,000 general aviation, and 30,000 government aircraft operations (Coast Guard, FAA, military). The annual Airport operational capacity has been reduced because of turbulence caused by large aircraft, resulting in a greater separation between aircraft than occurred in 1970. See Appendix E for a more detailed description of air quality.

With respect to the EPA standards, it is recognized that these standards are subject to change and that it is the responsibility of Airport management to comply with the latest standards.

High altitude aircraft emissions is a subject of national or international concern. This form of pollution would not be affected by the number of aircraft entering or leaving San Francisco International Airport, but rather by the number of aircraft which enter the region or overfly the area.

2. Water Quality

The San Francisco International Airport discharges effluent into the Bay from three sources: a sewage treatment plant, and two systems of combined storm drain and industrial treatment.

The Expansion Program would provide for cleaner water being discharged into the Bay. A sewage treatment plant was recently constructed and an industrial waste treatment plant is provided in the Expansion Program.

These projects, together with some support projects, would treat water more completely than is being done today.

The facilities that are presently used in controlling effluent to State standards consist of the following:

- Sewage. A new 2.2-million-gallon-per-day (average) sewage treatment plant at the North edge of the airport property.
- Industrial Waste. Source control by means of separators at the tenants' facilities followed by two oxidation ponds for detention of effluent for 13 days (North Pond) and 7 days (South Pond).

Currently, waste discharge is in general compliance with existing State water quality standards, except for toxicity of the effluent from the treatment plant. Water quality compliance with standards is reviewed in Appendix H.

For both sewage and industrial waste treatment, corrective measures are put into effect when water quality tests, some of which are conducted daily, exceed standards. Enforcement regulations are applied to tenants on airport property.

The airport Expansion Program provides for additional effluent control capacity to meet project needs to 1985. The elements of the development program that concern effluent treatment are:

- Construction of an industrial waste plant.
- Deep water sanitary outfall to one mile offshore.
- Industrial waste force mains from oxidation ponds to the industrial waste plant.
- Expansion of sewage treatment plant.
- Industrial waste-pumping stations.
- Replacement of existing sanitary sewers (to increase capacity and operating pressure).
- Stand-by power station for the 2.2 mgd sewage plant.

The bases for developing these expanded water quality control facilities were:

- A projection of additional wastewater by type and constituent characteristics brought about by the general Expansion Program.
- A forecast of water quality standards applicable to the projected period.

K. Will Development Adversely Affect the Water Table of an Area?

The water table in the airport area is approximately 5 feet above sea level in wet winter months and drops several feet during the dry summer months. The exact amount of drop during summer months

has not yet been accurately determined. The water table is above mean sea level for the following reasons: *

- The fill which is superimposed upon the Upper Bay mud tends to increase the pore water pressure in the mud by virtue of its weight, so that the water is forced to flow in all directions including upwards.
- The groundwater emanating from the hills to the west travels toward the Bay and it also courses between the interface of the fill and mud. The hydrostatic pressure which causes the water to flow forward also forces it to build up a head in the fill above the mud.

Numerous past and ongoing airport construction projects have indicated that construction affects the water table very little. For instance, the soil in the North Terminal foundation excavation is relatively impermeable. The amount of water entering the foundation excavation was extremely small. The drawdown effect of the seepage into the excavation, although not measured, could not have been great even in the vicinity of the excavation, and would not have been discernible at any location off of the airport. Since the North Terminal foundation required as large an excavation as any of the facilities would require in the entire Expansion Program, the effect of the excavation on lowering the water table is expected to be negligible.

All of the foundations of the facilities being constructed are to be water-proofed so that the water table can assume its normal position after construction has been completed.

Groundwater will not be pumped for daily water supply purposes. Water for domestic use or fire-fighting purposes is obtained from the San Francisco Water Department.

* Lee and Praszker, Soil and Foundations Exploration, Proposed Expansion of San Francisco International Airport, April 18, 1969

L. Employment Impact

In 1965 there were 15,530 people employed on or adjacent to the Airport in the categories of Air Transportation, Hotel and Federal Government employees. This number of basic employees is expected to increase in these categories by 13,655 people between 1965 and 1985.

These basic employees would create a secondary employment impact. A study by the Institute of Transportation and Traffic Engineering of the University of California indicated that in 1980 for the larger counties in the Bay Area, there will be 1.25 population-serving employees for each basic employee. These population-serving employees would be barbers, food service personnel, bankers, etc. If this ratio holds true for later years, the 13,544 basic employees would create jobs for 17,100 population-serving employees.

M. Utility Services Changes.

1. Water

The total airport utilized 1.95 million gallons of water per day in 1968-1969. This figure is expected to increase to 5 million gallons of water per day with a peak day demand of 7.5 million gallons. This water is supplied to the Airport through the Water Department system of the City and County of San Francisco. In 1972 this system supplied 251 million gallons per day and by 1985 expects to supply 350 mgd. The airport's use would amount to 1.4% of the daily supply.

2. Sewage

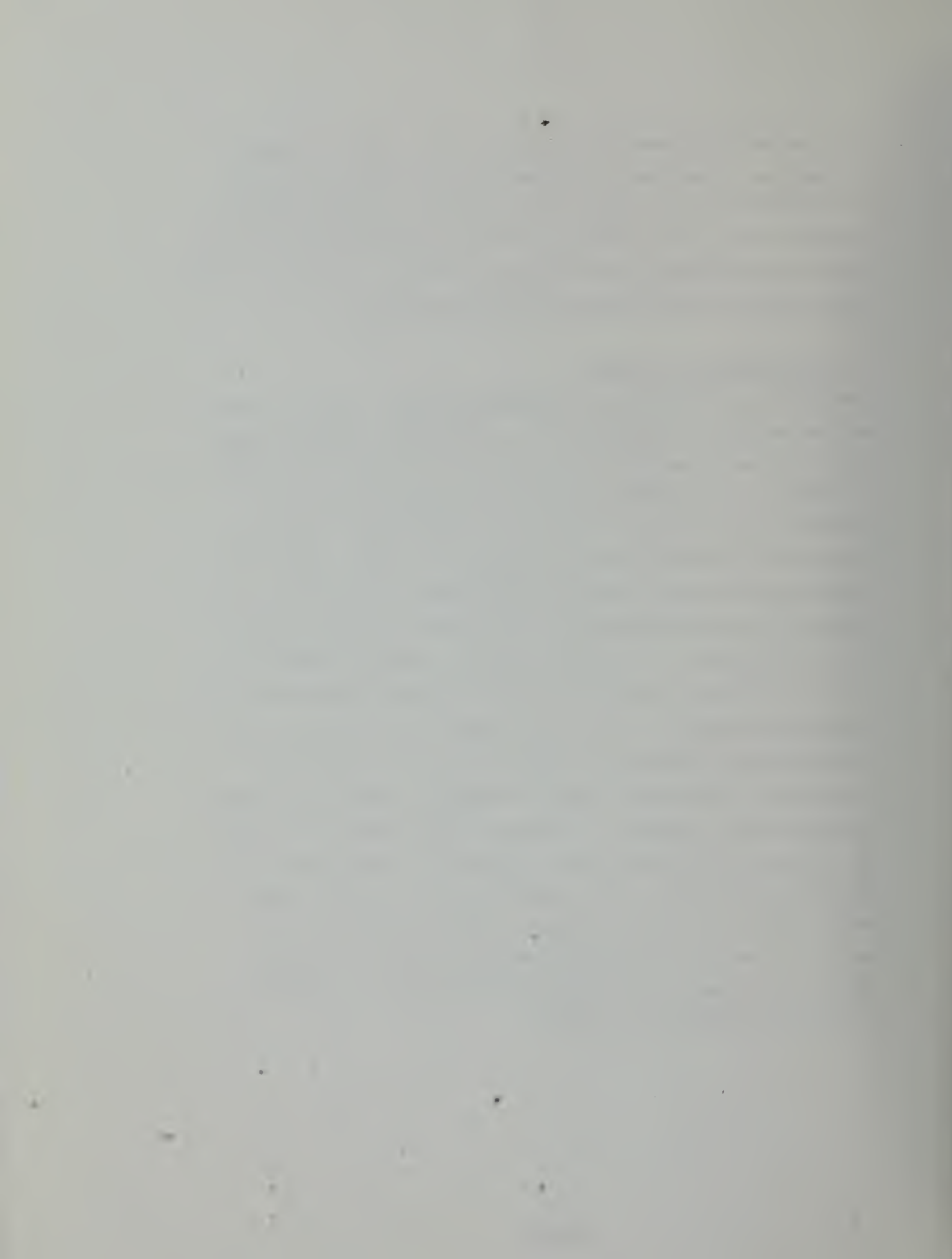
The airport has a separate system for handling sewage. Industrial wastes and storm flows are a separate system. The 5 million gallons of water used per day will be disposed of through a new sewage treatment plant, and a 2,500,000-gallon industrial waste treatment plant with domestic consumption, irrigation, and losses making up the rest of the 5 million gallons consumption. The Airport completed a new 2.2 million-gallons-per-day sewage treatment plant in March

1972, including the necessary influent and effluent lines and utility connections. A deep-water sanitary outfall is budgeted to provide a more effective means to comply with federal water quality standards. The airport has a daily monitoring system to report effluent quality and ensure that the effluent meets water quality standards. Industrial areas within the airport have to conform to state standards.

3. Industrial Waste Disposal

The Airport generates industrial liquid wastes from airplane cleaning and maintenance operations and from washing motor vehicles. These operations are at many separate locations on the Airport. Occasional fuel spills also contribute to the volume of industrial waste. The industrial wastes discharge into the storm drain system. During dry weather, the industrial waste water flows to two oxidation ponds for treatment prior to being pumped into San Francisco Bay. During wet weather, the industrial wastes are diluted with storm water and flow directly into the Bay. The industrial wastes effluent is sampled each month and results are reported to the Water Quality Control Board.

The Expansion Program includes budget items for an industrial waste treatment plant, force mains, and pump stations. The plant will treat industrial wastewater and will be designed to produce an effluent that meets future standards of the Water Quality Control Board. These facilities are under design and are scheduled for construction to be complete by mid-1975. The net effect will be to provide an improvement by 1975 over existing conditions. The Airport is required by law to meet whatever water quality standards are set by the Water Quality Control Board. The water quality standards for 1985 have not been completely defined to-date.

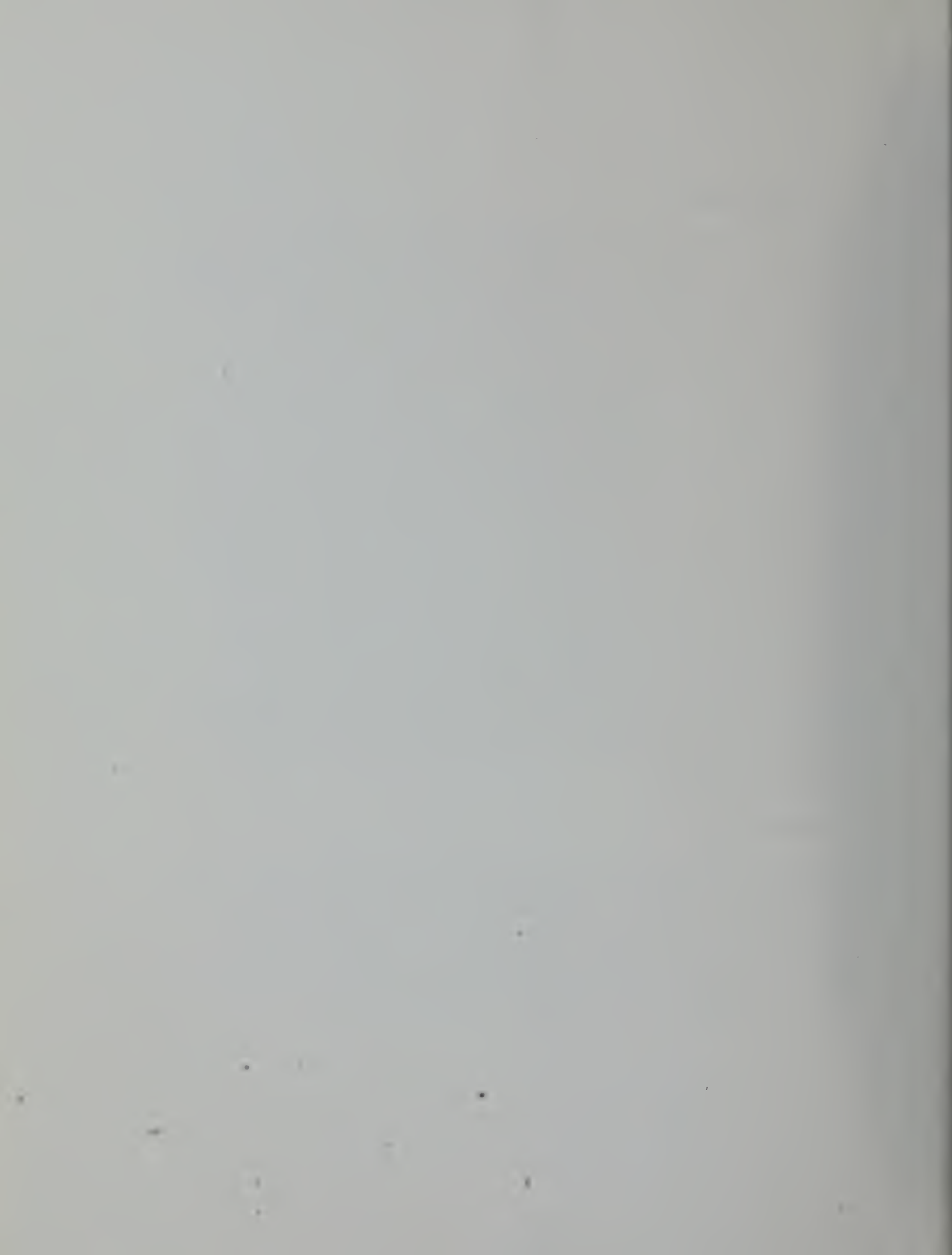


4. Storm Drains

The drainage system at San Francisco International Airport removes stormwater from runways, taxiways, and other paved and roofed areas and limits stormwater flooding in unpaved areas. The drainage system is a series of pipelines and canals that carry the stormwater to the Bay. Most of the system drains to the two detention basins described in the industrial waste disposal system. A small part of the system near the ends of runways 19 and 28 drains directly into the Bay. The Expansion Program envisions some additions to the drainage system by a series of pumps and related facilities to enable the system to operate better at high tides. The storm drain water would discharge into the Bay at the same point as it now does, but it would be able to do so at all tides, instead of just at low tides. At higher tides, the Bay can accept the storm water with less disturbance to the Bay mud. This would be an improvement over existing conditions. The California Regional Water Quality Control Board studied the storm drainage discharges from these runways and determined there was no significant adverse impact on the aquatic environment from these discharges directly into the Bay.

5. Natural Gas

Natural gas is distributed to San Francisco International Airport by the Pacific Gas and Electric Company (PG&E). The average winter gas use in 1969 was 500,000 cubic feet per hour. The 1985 demand is expected to be approximately 1,300,000 cubic feet per hour. Existing supply lines to the Airport can supply the increased rates.



6. Aviation Fuel

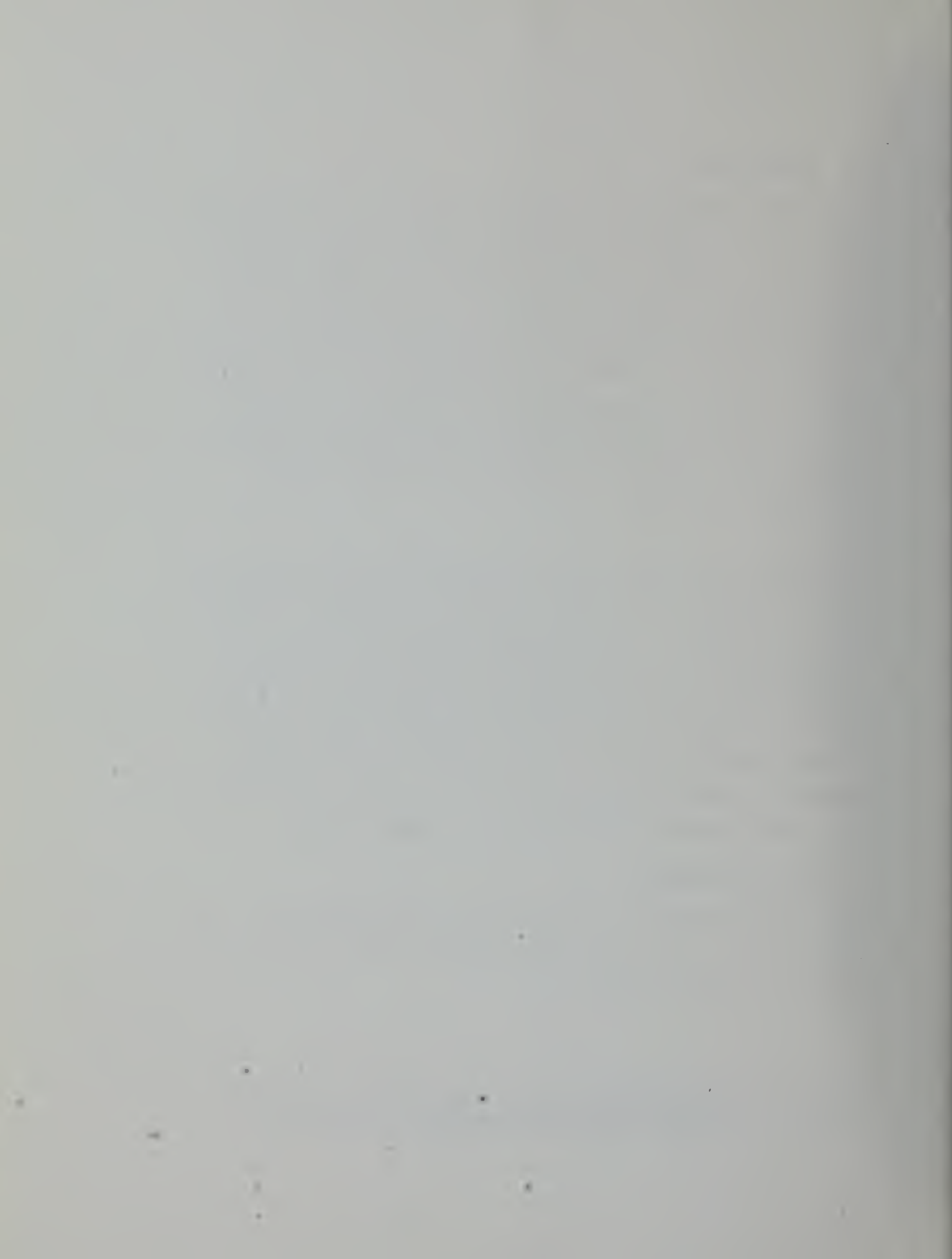
The number of annual airline operations is expected to decline slightly from 333,000 in 1969-1970 to 310,000 operations in 1985. This reduction is due to the larger separation between aircraft required because of air turbulence created by large jets. This lesser number of aircraft would require only slightly more aviation fuel in 1986 than in 1972 because of the larger average size of aircraft in 1986. The calculated daily operational fuel consumption for aircraft serving the Airport in 1972 was 225,000 gallons per day, while in 1986, with the greater percentage of more efficient aircraft, the rate will rise about 11% to 250,000 gallons per day.

Aviation fuel is delivered to the Airport now either by underground fuel lines or by barge to a dock on the north side of the Airport. The fuel is held in storage areas and then pumped by underground fuel lines to fuel hydrants at aircraft parking positions. The barging operation is an interim procedure that is used now because of slide damage to one fuel line in Oakland. When the fuel line is repaired, the barging of fuel will become an emergency only procedure. In all fuel handling or transfer operations, precautions are taken to avoid spills or possible fires. Fire regulations in this regard are monitored closely.

7. Solid Waste Disposal

Solid wastes are generated at San Francisco International Airport. The characteristics of weight and composition for the four major sources at the Airport are the following:*

*Metcalf and Eddy, Analysis of Airport Solid Wastes and Collection Systems, San Francisco International Airport, March 1973



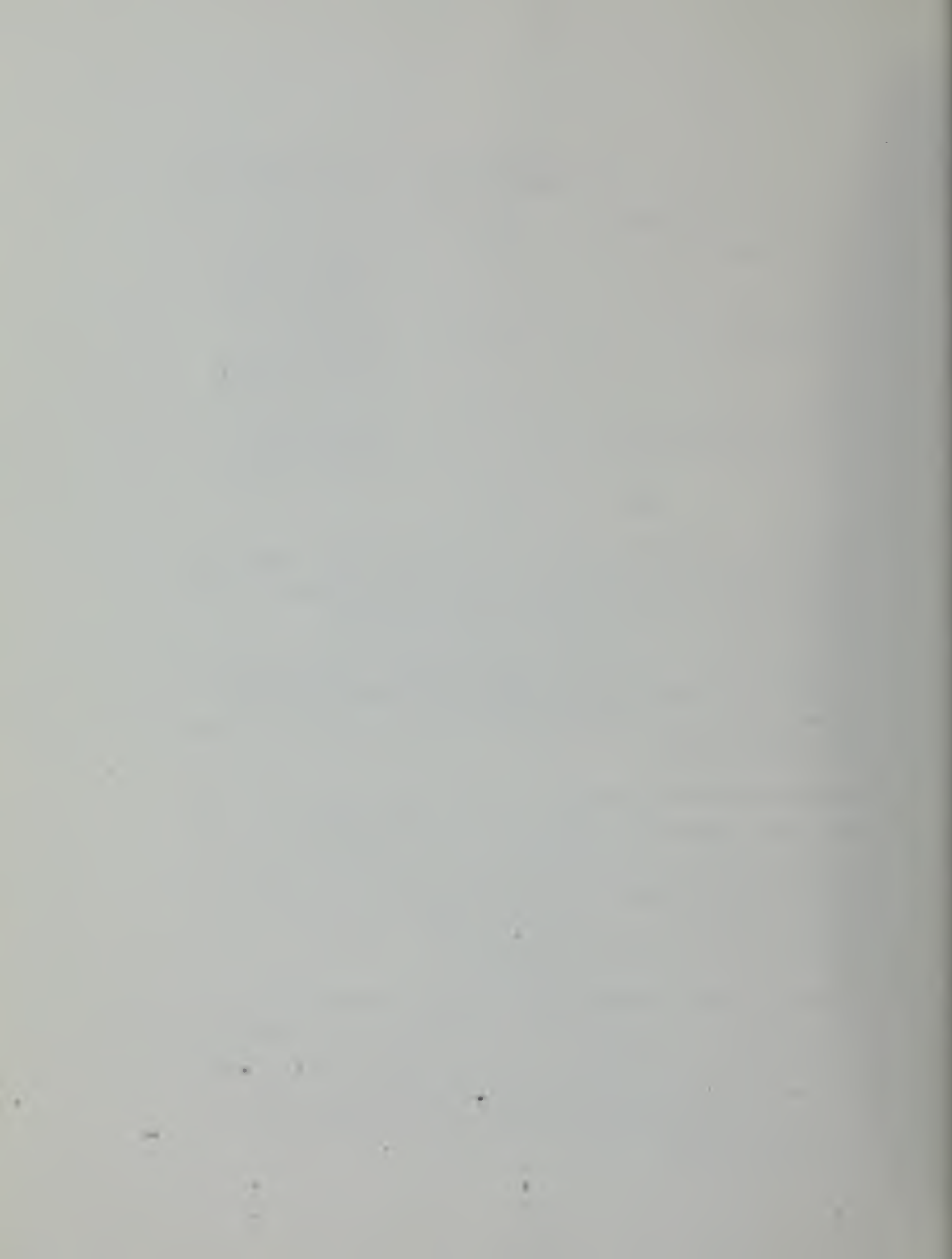
	Weight (tons per week)	Primary Composition Type
Passenger Terminals	68.7	71 percent paper
Air Freight Area	29.8	46 percent paper 17 percent wood 10 percent plastics
Aircraft Service Centers	133.2	34 percent food 32 percent paper 12 percent metal 10 percent plastics
United Air Lines Aircraft Maintenance Base	55.6	51 percent paper 15 percent food 10 percent plastics
Total	287.3	

The major solid-waste generator is the aircraft service center, which includes both hangar wastes and aircraft passenger wastes. The most significant waste is from aircraft flights serving meals.

The 287 tons per week of refuse generated at San Francisco International Airport constitutes 2% of the solid waste generated in San Mateo County in 1970. Five hundred tons per week are projected to be generated at SFIA by 1985.

Existing solid-waste systems are controlled individually by each Airport tenant, except in the terminals where the Airport authority controls the system. A single hauler serves all tenants on the Airport and removes the wastes from the Airport for disposal at a sanitary landfill. Compactors are planned for installation in the new facilities to reduce the volume of this solid waste.

Demolition material is hauled in debris boxes or standard earthwork construction vehicles (dump trucks). Wood wastes, normally placed in debris boxes, are disposed of off the airport at the sanitary landfill. Dirt, broken concrete, and broken asphalt pavement are disposed of on the airport in areas where the existing land has subsided and benefits from filling.



Solid wastes from the airport and most other areas of San Mateo County are disposed of at the Menlo Park sanitary landfill. San Mateo County, in conjunction with the City of Menlo Park, estimates that the Menlo Park sanitary land fill site will last for seven to ten years, at which time it will be turned into a park. There are other existing sites in San Mateo County which could be used, such as one at Half Moon Bay, as well as several potential ones. A definitive plan for the development of another site, after the Menlo Park site is filled, has not been prepared by San Mateo County. The Airport will cooperate with local authorities in studies or plans for alternate sites.

8. Electrical Load

Electrical energy used by the Airport is generated by the City and County of San Francisco's Hetch-Hetchy project, but is delivered through the Pacific Gas and Electric Company system. The Airport is served by three 12 kv feeders from two different substations. All three feeders serve only the Airport.

The peak Airport electrical load (excluding the United Air Lines Maintenance Base) in 1972 was 18.0 million volt amperes (mva). This is expected to increase to 62.8 mva by 1978 and may ultimately reach 90.0 mva.* Half of this ultimate peak load would be in the terminal area for lighting the larger buildings, air conditioning, baggage handling and other automated equipment. The other half would provide power to the remainder of the Airport, including possible new airline facilities such as maintenance hangars, flight kitchens, aircraft wash racks and like facilities. This will be 6 percent of the expected 1985 usage of San Mateo County. PG&E has constructed a substation on the Airport property west of Bayshore Freeway which will have the capacity to meet the full needs of the Airport when the necessary equipment is installed.

*R. W. Beck and Associates, Master Utilities Plan and Electrical System Study at San Francisco International Airport, May 1972

N. Ground Transportation to San Francisco International Airport

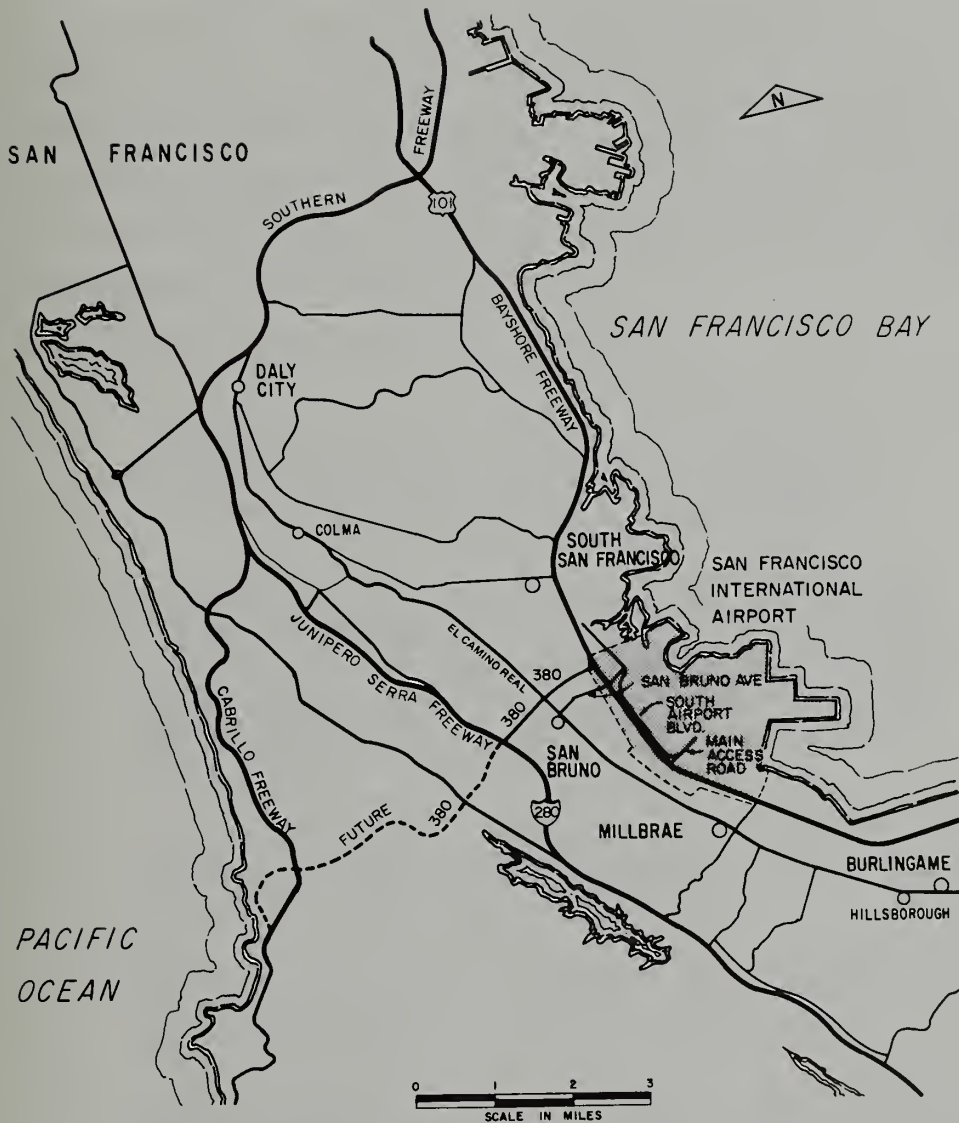
1. External Access

San Francisco International Airport is on the east side of the San Francisco Peninsula, some 15 miles south of the City's central business district. It is in San Mateo County near the cities of San Bruno and Millbrae. Its location in relationship to access facilities is shown in Figure 2-3.

The principal existing approach route from the north or south is the Bayshore Freeway (U.S. 101). A directional-type interchange gives exclusive access to the Airport, whose main terminal is one-half mile east of the freeway. U.S. 101 is convenient to all major population centers on the San Francisco Peninsula, but due to increasing pressure of other traffic will not give a high level of service to the Airport indefinitely.

By 1976, Interstate Route 380 (I-380) will be completed between Interstate 280 and the Airport. This will provide a second freeway route directly to the Airport.

There are also secondary external links to the Airport. San Bruno Avenue interchanges with Bayshore Freeway about 1.5 miles north of the main Airport access road, and provides a crossing that links to Airport Boulevard north of the main terminal area. These two roads provide direct access to the United Airlines Maintenance Base, and allow indirect access to the passenger terminal area via the frontage road along Bayshore Freeway. Millbrae Avenue and Old Bayshore Highway both interchange with Bayshore Freeway south of the Airport; they intersect just east of the freeway with frontage road and allow indirect access to the terminal area. The Expansion Program includes provisions to improve the intersections of Millbrae and San Bruno Avenues with Frontage Road and to widen Frontage Road to four lanes between these intersections to relieve congestion along these routes.



**Regional Access Plan,
San Francisco International Airport**

Figure 3-3.

Although there is a Southern Pacific Company rail line which serves commuters along the Peninsula, it does not serve the Airport effectively since there is no station at the Airport, even though it adjoins the west boundary of the Airport.

The State Division of Highways in April 1973 made a study of the external access to the Airport after the I-380 route was finished. The complete text of this study, with a supplemental letter from District 04, State Department of Transportation, is in Appendix I. The study included traffic on major routes with and without the increase in Airport passengers predicted for 1985.

The results of this study are the following:

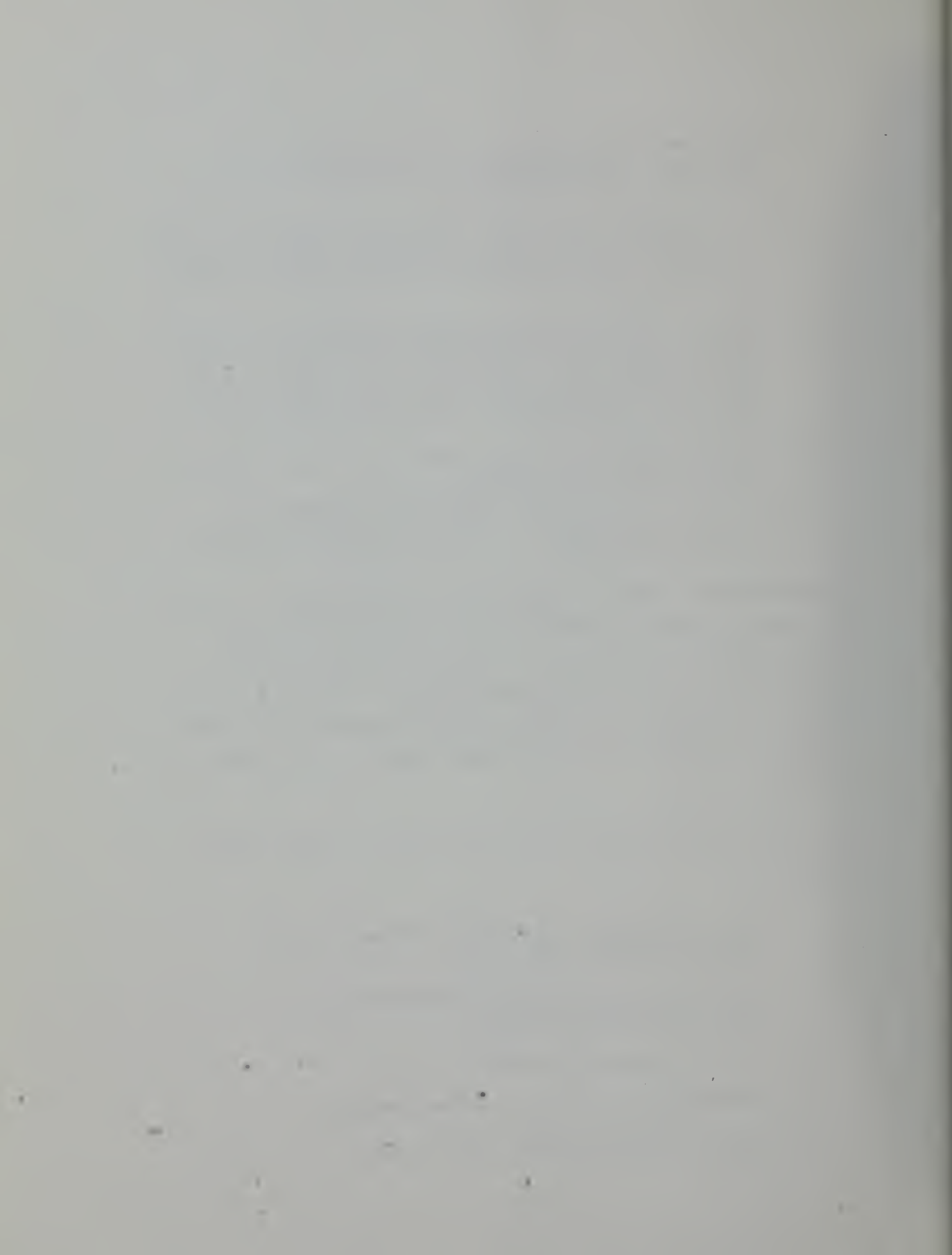
- Vehicle traffic is above capacity now at peak hour on 101 south of Millbrae Avenue and north of Airport Boulevard and congestion will increase in 1985.
- Because 101 will be over peak hour capacity, drivers will be forced to either wait in traffic, divert to other access routes or adjust their trip time. There is sufficient capacity throughout the day to service the airport if people are willing to schedule their trips at times other than peak hour.
- The portion of the freeway between Airport Boulevard and Millbrae Avenue will have capacity to accommodate all expected traffic without congestion.
- Slight congestion will occur at peak hour on the 380/280 Interchange in 1985. The increased airport traffic is a minor contribution to this slight congestion.
- Slight congestion will occur in 1985 on I-280 north and south of I-380. The increased airport traffic is a minor contributor to this slight congestion.
- Vehicular traffic on Millbrae Avenue at 101 is not expected to increase in 1985 over 1970.

- Vehicular traffic on San Bruno Avenue over 101 is expected to drop significantly from 36,000 Average Day Traffic (ADT) to 11,000 ADT.
- No diversion of traffic from 101 to streets in South San Francisco is anticipated. Should airport related industries be permitted to locate in South San Francisco, these would cause increased vehicle traffic.
- When northbound traffic on 101 becomes congested, there will probably be traffic to the airport diverting from the freeway at the Broadway exit in Burlingame to use old Bayshore Highway. This is not expected to exceed a few hundred vehicles during the peak hours.
- Traffic on El Camino Real south of Millbrae Avenue will not be affected by the Airport Expansion.
- Traffic on El Camino Real near I-380 will experience increases in local traffic but any impact due to Airport Expansion will be minimal.

Not specifically detailed in the State study, but assumed herein, is that truck traffic volumes would increase also. If truck highway usage should follow the current pattern, most Airport-related truck movements would occur at other than peak passenger car traffic hour, on the freeway. Also with an increase of containerization of air cargo, there would be more efficient use of trucks which would lessen the increase in numbers.

The traffic demands predicted by the State are based on the following assumptions:

1. The 1990 population for San Mateo County is 677,000 compared with 556,000 in 1970.
2. A doubling of passengers means a doubling of vehicular traffic to and from the airport.
3. No increase in transit facilities.
4. No major change in timing of airport operations.
5. Peaks on each road occur at the same time.



Clearly these assumptions present the worst possible case, since only 24,000,000 of the 31,000,000 annual passengers are projected to arrive in private vehicles. Improvement in transit service will lower the Airport peak hour traffic demand figures calculated by the State.

To mitigate the congestion on 101, there are the following courses of action or combinations thereof:

1. Increase roadway capacity
2. Meter freeway on-ramp traffic
3. Provide alternate modes of transportation
4. Off site parking, with shuttle bus
5. Reschedule airline operations

The airport will encourage alternate modes of transportation such as bus or BART, can encourage rescheduling of airline operations, and can encourage off-site parking.

2. Internal Parking and Access

The public parking available at San Francisco International Airport in 1972 and the projected parking in 1985 are listed below.

<u>TABLE 3-1</u>		
	<u>Number of Spaces</u>	
	<u>1972</u>	<u>1985</u>
Airport Garage	3,110	7,300
Parking Lot No. 1	630	--
Parking Lot B	569	--
Remote Parking	910	1,410
Short Term, NE & SE Courts -		200
	<u>5,219</u>	<u>8,910</u>

Current plans indicate that by 1977 the garage would be expanded to a capacity of 7,300 spaces and would incorporate Lot No. 1. Lot B is the building site for proposed Administration Building. The total public parking would then be 8,910 spaces. Other available Airport parking is shown in Table 3-2.

TABLE 3-2

<u>Employee Parking</u>	<u>Number of Spaces</u>
Near TWA Hangar	840
Near Pan Am Hangar	1260
Near UAL Service Center	1656
Near Cargo Facilities & Post Office	2615
Near UAL Maintenance Area	3386 *
Near Flying Tiger Area	358
Near U.S. Coast Guard	100
Near UAL North Site	171
Near American Hangar	<u>400</u>

Subtotal 10,786

* includes 40 spaces for buses

<u>Rental Car Storage & Other</u>	665
---------------------------------------	-----

Total

11,451

(In addition, 400 spaces for the Hilton Inn patrons and employees and approximately 200 truck-loading docks exist at the airport. A remote, privately operated parking lot north of the airport with shuttle bus service to the airport terminal began operating in 1970, and a similar one south of the airport began operating in 1971.)

The main access road makes a large loop around the parking structure, its outer perimeter skirting the two passenger terminal buildings, as shown in Figure 2-4. The loop is separated into two roadways at different levels, the upper one at the level of enplaning terminal operations and the lower one at the level where deplaning passengers collect their baggage. This loop has been expanded to skirt the North Terminal, the roadways widened and closures to the loop provided at both levels.

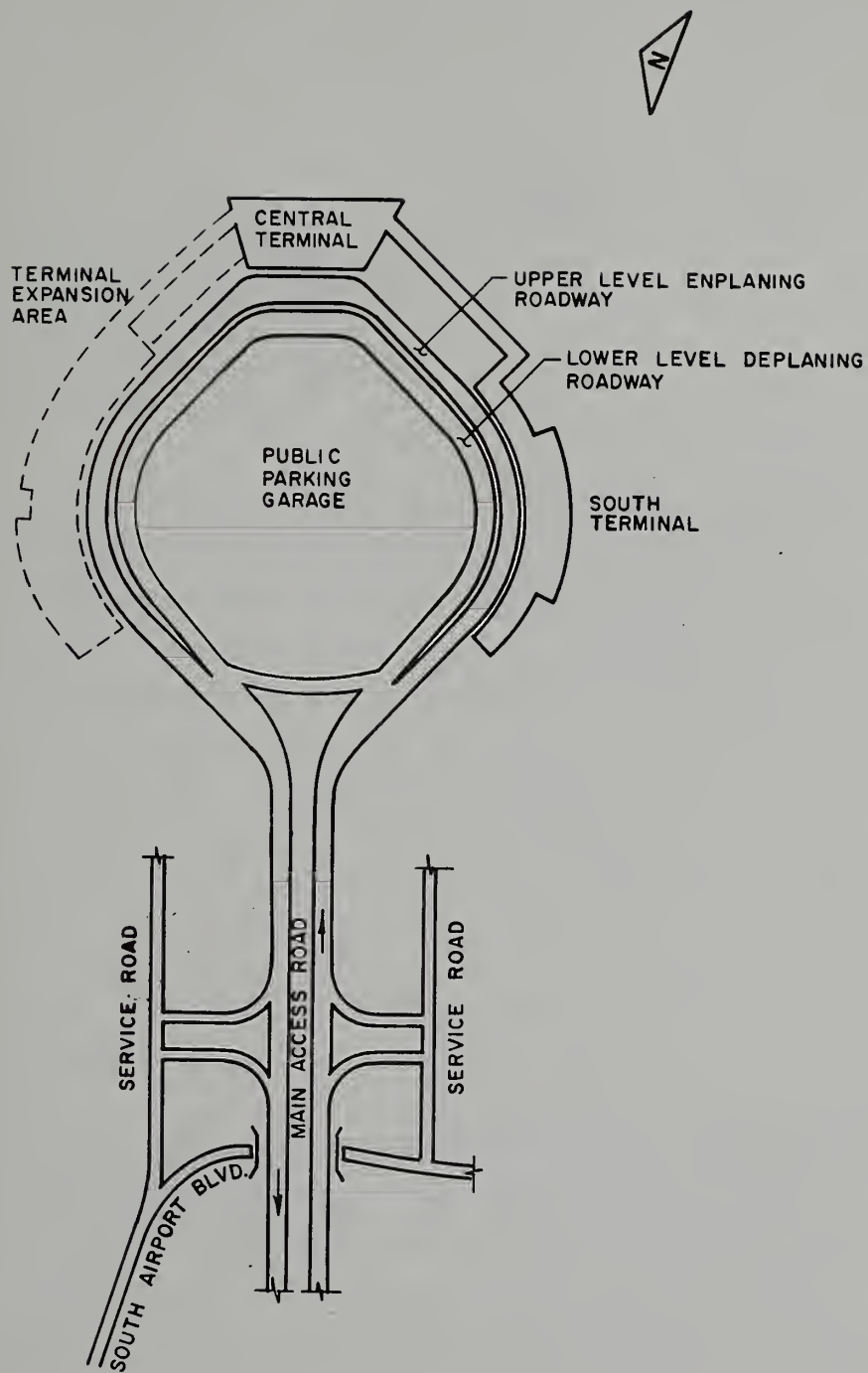


Figure 3-4. Airport Terminal Layout, San Francisco International Airport

The curb space available for passenger pickup and setdown (measured in linear feet) is as shown in Table 3-3.

TABLE 3-3

	<u>Enplaning</u>	<u>Deplaning</u>
Total at South Terminal	800	800
Total at Central Terminal	<u>800</u>	<u>800</u>
Total Linear Feet of Curb Space for Auto Passenger Pickup and Dropoff	1,600	1,600

The new North Terminal would add 800 linear feet of usable curb space to both the enplaning and deplaning roadways. Eventually, the two plaza areas between the three terminals would be enclosed so that a continuous structure would be formed. The usable curb space would then be approximately 3,200 linear feet for each of the roadways.

3. Rapid Transit

A report entitled Route Location, Airport and Approach, San Francisco Airport Access Project by Parsons, Brinkerhoff, Tudor, Bechtel, Wilbur Smith, Kirker, Chapman, March 1971, described studies made to extend BART facilities to the airport. A total of 20 alternatives were investigated to determine the best method of serving the airport.

The recommended alternate is a subway through the airport. Provisions are being made in the airport expansion program to physically accept BART when it is constructed. The report indicated that if BART were extended from Daly City through the airport to San Jose, 70,000 air-passenger-related trips might be expected after 1985 on a busy peak day. This could be a substantial diversion of air passengers from autos, but would be a small portion of the capacity of the BART line.

The RASS Final Report, on page I-17, states "... the assumption of the maximum percentage of passengers likely to use transit is raised from 18 to 23, in order to clearly make transit access a condition of the recommended plan." Furthermore, this figure of 23 is an average for three airports: San Francisco, San Jose, and Oakland. Wilbur Smith & Associates prepared a report that shows the potential transit passenger figures are 27.3% to 32.5% for San Francisco, 17.7% or 18.0% for Oakland, and 10.0% to 10.1% for San Jose.* This report is the basis for the airport access portion of the Final Report.

If BART is not extended to the airport by 1985, other types of mass transit would be developed. Currently, 15 percent of the air passengers use either the Airporter bus or Greyhound. This type of service could be expanded to provide transportation terminals for the Airporter bus in other locations such as San Jose, Palo Alto, and Oakland. In order to establish this type of additional service, the airport will encourage concessionaires, such as the Airporter, to provide bus service from population centers to the airport. This may well require subsidized service until patronage buildup is sufficient for the operator to make a profit.

*Wilbur Smith & Associates, Airport Access, Bay Area Study of Aviation Requirements, ABAG, June 1970

O. Earthquakes.

The buildings to be constructed at San Francisco Airport are relatively low structures, three stories above the ground, and in earthquake situations are expected to be affected less and have less damage than highrise buildings constructed in the same area. These buildings would be constructed on piles that are founded on bedrock, so the buildings do not rest on bay mud.

Current design philosophy for all types of construction (not limited to airports) is to design to minimize life hazard, and to restrict property damage to reasonable limits in the event of a great earthquake. There is no consensus on what constitutes a "reasonable limit" to earthquake caused property damage. It is noted that earthquake-resistive construction, which protects life, is realistically feasible, although earthquake-proof construction is not guaranteed in new buildings.

The Office of Emergency Preparedness prepared an internal report in 1972 titled "A Study of Earthquake Losses in the San Francisco Bay Area." Following is an excerpt from the report:

The great Alaskan earthquake of 1964, with its 8.4 magnitude, provides a reasonable guideline for experience data from a great shock. A total of 13 airports were found to have had runway or taxiway damage out of 64 airports which were inspected. Virtually all airports were operational within hours after the shock despite runway damage and building damage.

The foregoing incomplete experience record is rather reassuring with respect to the most important function of an airport; namely, to allow airplanes to land and to take off with people and goods.

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P. Tsunami Impacts.

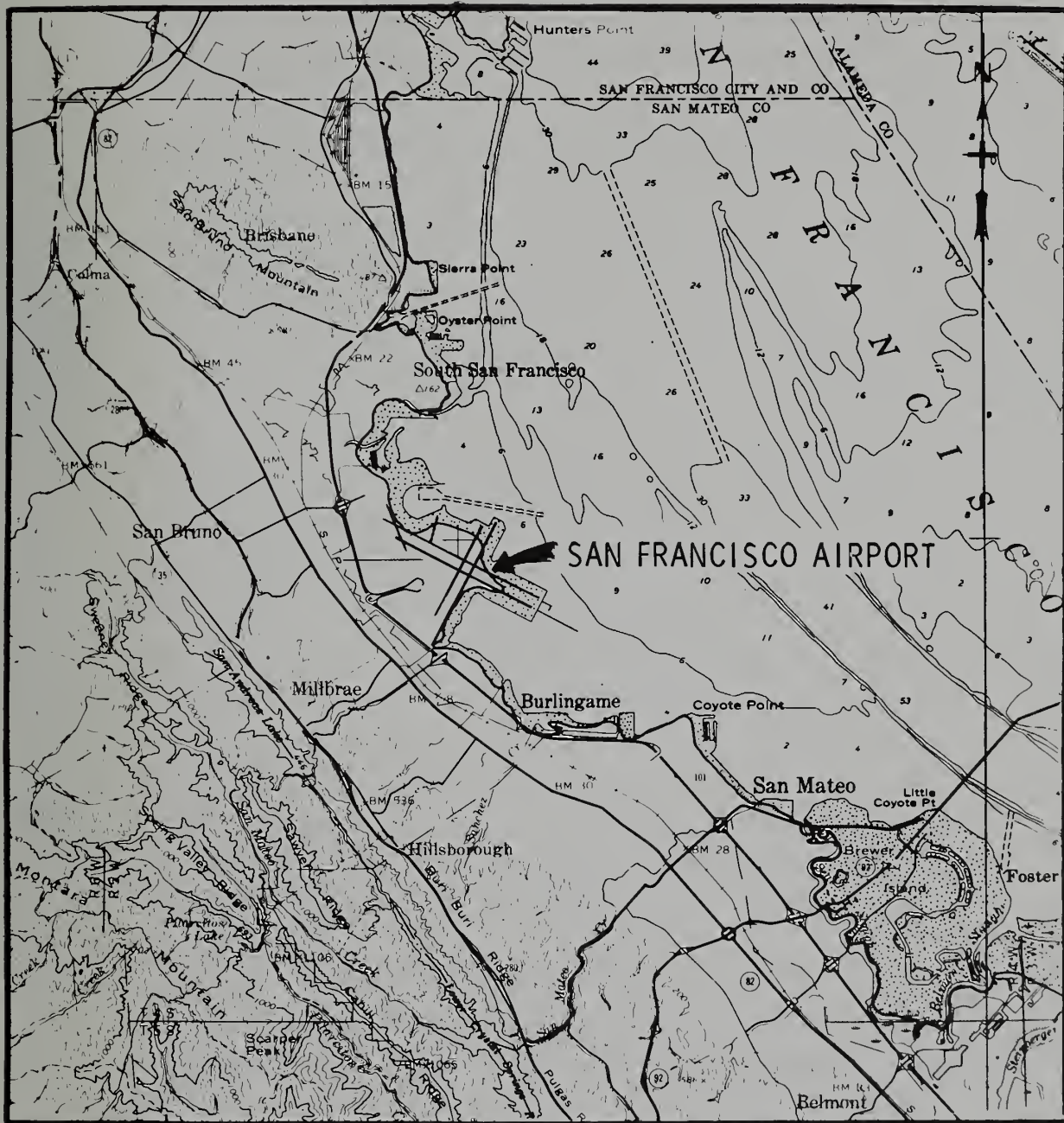
The Department of Interior, United States Geological Survey, prepared a tsunami map in 1972 that assumed a 20-foot-high wave at the Golden Gate Bridge, and showed the water runup along the ends of runways 19L and R and 28L and R and the seaplane harbor area. This is shown on Figure 3-9. The passenger terminal area and air cargo areas are not shown as being affected. A 20-foot tsunami wave may arrive at the Golden Gate once every 200 years. Because the public areas are not in tsunami runup area and the occurrence is infrequent, the tsunami effect on the development and the hazard cost would be small.

The tsunami was assumed to occur at a tidal stage of average higher high water, a stage which is equaled or exceeded about 4 percent of the time at the Golden Gate. The tsunami runup is estimated to decrease 1 percent with distance travelled over land, or 1 foot for every 100 feet of travel.

The report Geologic Hazards and Public Problems by the Office of Emergency Preparedness, 1969, indicates that there is no resonance for tsunamis in San Francisco Bay. The waves come in and dissipate. As the tsunami waves come into San Francisco Bay, they decrease in height, scatter, and dissipate their energy. Damage inside San Francisco Bay is due essentially to the horizontal motion of the water, currents, which causes ships which are not moored properly for this particular type of current to break loose and cause damage.

Q. Conservation of Fuel.

The jumbo jets, based on a passenger mile basis, are more fuel efficient than the automobile. The automobile is the primary means of inter-city traffic. Buses and trains are more efficient per passenger mile than



SOURCE: USGS



Area that may be inundated by tsunami waves with a runup of 20 feet at Golden Gate.

Figure 3-5

TSUNAMI RUNUP AREA

either the car or airplane, but are not used significantly in inter-city travel by the United States society. This society has continued to increase its use of inter-city travel and has selected the method of transit primarily by convenience without regard for conservation of fuel.

Transportation forms and their equivalent efficiencies are listed in Table 3-4.

TABLE 3-4

			Passenger Miles Per Gallon
1.	Train	(50% occupancy) ^a	75-100
2.	Large Bus	(58% occupancy) ^a	125
3.	Automobile	(25-50% occupancy) ^a	12-32
4.	747	(61% occupancy) ^b	26
5.	L-1011	(61% occupancy) ^b	23
6.	DC-10	(58% occupancy) ^b	21.5

Sources:

- a Rice, R. A., ASME 70 WA/ENER-8, Nov. 1970, Table 12
- b Derived from data in Aviation Week & Space Technology, December 18, 1972, pg 27

In the past, the U.S. public has elected to use transportation based on convenience first, with other factors being of lesser importance. The use of inter-city transportation between 1950 and 1970 is illustrated on Table 3-5.

Table 3-5 shows that the automobile, a relatively inefficient (from a fuel consumption standpoint) means of transportation, was used the most. Airways absorbed an increasing percent of the inter-city travel, increasing at the expense of the more efficient (from a fuel consumption standpoint) train and bus.

Table 3-5

INTER-CITY TRAFFIC VOLUME IN BILLIONS OF PASSENGER MILES

	<u>1950</u>	<u>1960</u>	<u>1970</u>
Personal Auto			
Volume	438	706	1,026
% of Total	86.2	90.1	86.6
Airways			
Volume	10	34	119
% of Total	2.0	4.3	10.0
Bus (Except School)			
Volume	26	19	25
% of Total	5.2	2.5	2.1
Rail			
Volume	32	22	11
% of Total	6.4	2.8	0.9
Inland Waterway			
Volume	1.2	2.7	4.0
% of Total	0.2	0.3	0.3
Total Volume	508	784	1,185

Source: 1972 Statistical Abstract of the United States

The average car provides 18.7 passenger miles per gallon, assuming an average of 1.5 occupants per car and 12.5 miles per gallon. The 1.5 figure is slightly higher than the 1.3 figure reported for occupants in private autos to the airport. The 12.5 miles per gallon is a figure used in 1972 EPA report for calculating auto emissions.

With a 60% seat load factor, the B747 provides 28.4 passenger miles per gallon of fuel and the DC10 or L1011 provides 29.4

The foregoing information indicates that the automobile is a prime user of petroleum and based on a passenger mile basis, the new aircraft are more efficient than the automobile. Buses, while much more fuel efficient on a passenger mile basis, are not a popular form of inter-city travel. Rapid rail transit is another relatively efficient inter-city carrier, but is not in general use. Information on rail rapid transit is provided in the section on alternates.

The potential fuel shortage is of national concern and must be solved at the national level.

R. Fill

The North Airport Fill project was commenced in March 1969 and completed in August 1970. This was carried out under a permit from BCDC. In connection with this fill, a fish-breeding area was provided by making islands and sand and rock spits off the fill.

Fifty acres of 180 acres West of Bayshore was filled between September 1969 and 1970. No further fill is planned in this area. The area was formerly leased out for grazing of cattle. The State Public Health Engineer and the San Mateo County Vector Control Specialist feel that this fill will significantly reduce the periodic problem of mosquitoes and rodents in this area, which will improve the environment.

The filling of the Seaplane Harbor and the associated roads and facilities in that area have been deleted from the Expansion Program.

No Bay fill is required for the extension of Runway 28R. This fill of this area was completed in 1969, with a surcharge to accelerate settlement prior to paving.

S. Air Freight.

Air freight aircraft operations are not expected to increase materially by 1985. The major reason is that as the larger jets come into airline use, their lower compartments have a large volume for accommodating cargo. For instance, a TWA 747 has 5,550 cubic feet of lower compartment space as compared to 1822 cubic feet of lower compartment space in a 707 and an all freight 707's total space of 7,610 cubic feet. The 747 passenger aircraft can carry in its lower compartment 3/4 of the load of an all freighter 707. Space utilization of the lower compartments of the existing large aircraft have been running in the neighborhood of 22 percent of capacity. This is an indication that passenger aircraft will have a large potential to carry freight since there will be more of them and the existing capacity is underutilized for cargo. The fleet of all cargo aircraft has been shrinking since 1970. Americans' freight fleet went from 16 aircraft in 1970 to 14 in 1972. TWA's has slipped similarly, from 13.2 in 1970 to 11.6 in 1972. United's number of freighters has remained steady. Pan American's all-cargo fleet has dropped from 22 prior to introduction of the 747 to 16 in 1973.

Except for 1966-1967, the last decade has been characterized by operating losses in domestic all-cargo service for both the combination and all-cargo airlines. Most airlines are not now buying new all-freight aircraft, since they have available cargo space in their passenger aircraft which is not being fully utilized.

T. Impact on Bay of Air Turbulence.

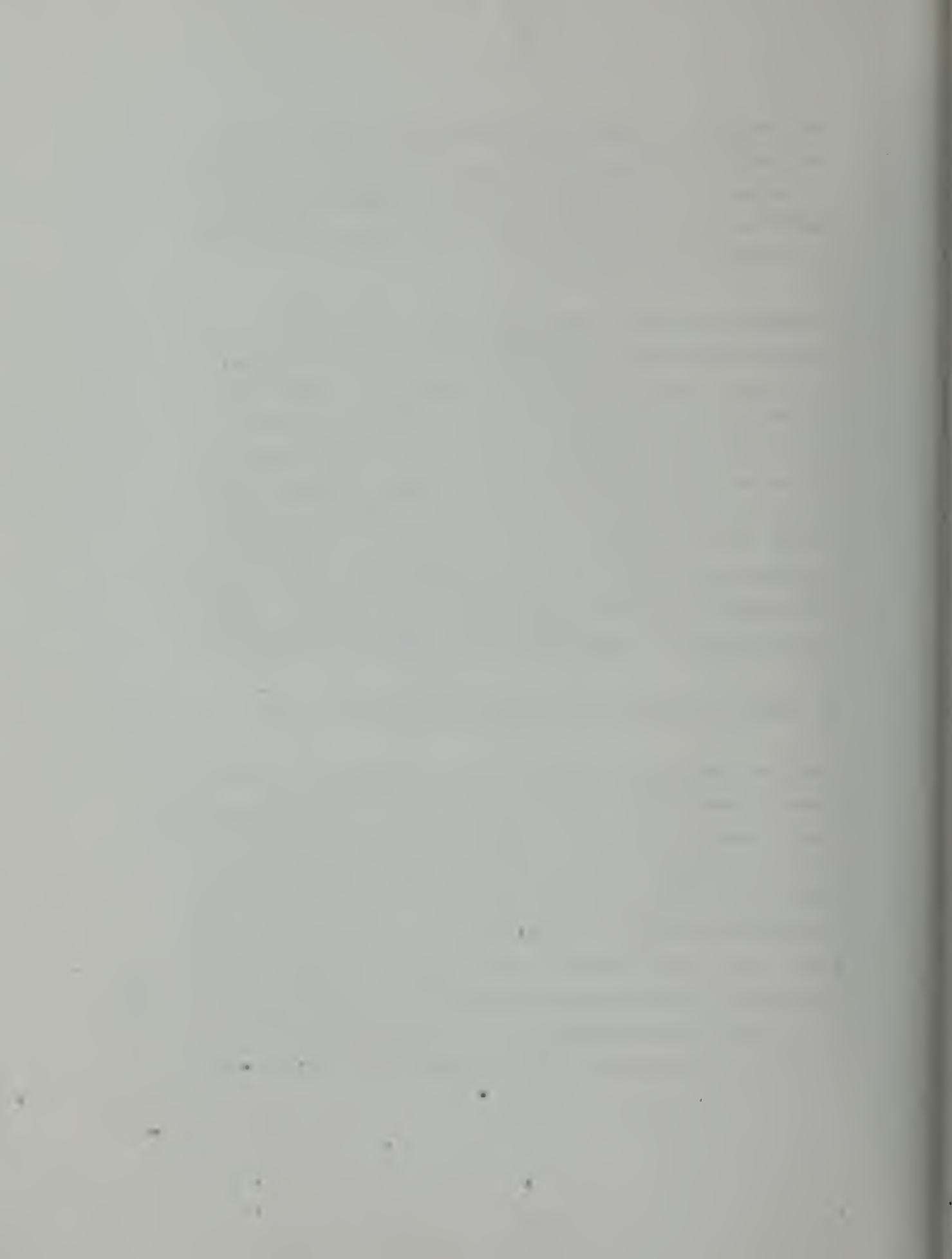
Turbulence effects on the Bay from aircraft operations: Turbulence on the Bay caused by aircraft is from two separate effects. One effect is jet blast created by aircraft at the ends of 28L or 28R and 1L or 1R as the aircraft

apply full power for takeoff. The jet engines of a 747 create a 35-mile-per-hour wind effect to 320 feet behind and out to 100 feet each side of the runway centerlines at breakaway thrust. The Bay is approximately 300 feet from the end of the runway, so the effect on small boats would be minimal.

A second effect is that large jet aircraft such as the 747 and DC-10 create a vortex behind the aircraft as it flies. This vortex may remain for six minutes in still air or is broken up in two minutes with winds of 10 miles per hour. The vortex settles below the aircraft flight path. Near the ground a "cushion effect" starts and the vortex settling changes to a lateral movement perpendicular to the aircraft flight path and about a half-wingtip distance (100 feet for the 747, 75 feet for the DC-10) above the ground. No studies have been documented for a cushioning effect over water, but it is expected to be similar to land, and hence the effect on the Bay or small boats on the Bay under the landing flight path is expected to be minimal.

U. Impact on San Carlos Airport and Half Moon Bay Airport.

The RASS final report indicates that general aviation activity at San Francisco Airport will remain constant at about 30,000 annual operations. General aviation includes all aircraft other than commercially scheduled service or military. However, that report indicates that general aviation activity will grow in the Bay Area. In San Mateo County, the growth will be concentrated at San Carlos and Half Moon Bay, unless a new general aviation airport is constructed. The flight patterns of commercial aircraft with respect to San Carlos and Half Moon Bay Airports will remain essentially as they are at present. Turbulence from the large jets will be above flight patterns at these airports.



V. West of Bayshore Development Impact.

The West of Bayshore Development, as conceived in the master plan prepared in 1968 by Wilsey and Ham of San Mateo, involved the conversion of existing pasture land to a light industrial area. Of the original 180 acres considered for development, only about 50 acres have been filled; and no more fill is contemplated as part of the proposed expansion program. Prior to filling the 50 acres, the land was leased for pasture use. Even though there was considerable standing water in the area during the rainy seasons, available pump capacity drained the area quickly. There was no area that could be considered a fresh-water marsh.

The project included in the expansion program is to complete the utility and road development for the 50 acres of filled land. The storm drainage canal has already been rerouted as proposed by Wilsey and Ham. The pump station lifting the water into the high-level Millbrae Canal has been re-equipped with large diesel pumps and has experienced no difficulty in coping with the excessive runoff of the 1972-1973 winter.

Sanitary sewage connections would be made to either the San Francisco International Airport (SFIA) sewage treatment plant or to the system of an annexing community, if such annexation goes forward. The main water supply to SFIA is considered adequate to supply the developed area.

Although no specific provisions have been made, it is anticipated the developed area would attract airport-oriented light industrial, commercial and educational facilities such as:

- Rental car storage and maintenance
- Remote parking for passengers and airport employees
- Freight brokers
- Ground support equipment rental and maintenance
- Aircraft parts warehousing and distribution
- Manufacturer's technical representative offices
- Airline crew training facilities
- Aircraft maintenance training school

With the possible exception of the latter two, all these facilities are capital intensive and would not require a substantial influx of employees. No manufacturing or other noisy facilities are anticipated. It is expected that the added demand for power, gas and water would be minimal.

The advent of I-380 and its various access and frontage roads will mark the commencement of usefulness for the West of Bayshore property because only then will adequate ingress-egress routes be established. It is expected that most traffic in the area would be of a commercial nature, arriving from and departing to either Bayshore Freeway, I-380 or the airport proper. Traffic from the San Bruno-Millbrae area should be limited largely to employees who happen to live in those two cities, or from local merchants supplying the various facilities in the development.

W. Environmental Controls During Construction — Proposed Method Of Accomplishment.

The major construction activities for the new terminal facilities where environmental quality may be a problem would include changing the existing terrain for automobile parking and aircraft parking; installing crushed rock under areas to be paved with asphalt; paving with asphalt, paving with Portland cement concrete in certain aircraft parking areas; and construction of the terminal buildings.

The construction materials for these activities would be obtained from existing suppliers, quarries, and asphalt plants in the area. The contractors would be required to operate in accordance with existing pollution control methods. Provisions will be included in the construction specifications to ascertain that the criteria for environmental controls during construction are met. Recommendations from Federal Aviation Agency (FAA) Advisory Circular AC 5370-7, Airport Construction Controls to Prevent Air and Water Pollution, would be included. The contractor would be required to maintain all excavations, embankments, haul roads, access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within or without the project limits free from dust that would cause a hazard to the work or to persons or property.

Construction access would be by existing public roads. Large trucks and heavy construction equipment would be prohibited from using the main access road unless there is no other feasible route.

The emission of smoke, dust, or other air pollutants from asphalt plants, rock quarries, concrete plants, and other construction equipment is under the control of the Bay Area Air Pollution Control District, which issues permits for such equipment when the equipment is in conformance with their requirements.

Noise would be generated by construction of the Airport expansion. Freeway traffic and aircraft operations have effectively "masked" any construction noise in this area in the past. The major portion of the expansion is east of the Bayshore Freeway, approximately 3,000 feet from residential areas. Construction in the airport property west of the Bayshore Freeway was primarily fill and the installation of utilities. Construction work is normally accomplished during daytime hours from 7:00 A.M. to 4:30 P.M. Construction work in the evening or night is done only for emergencies or to eliminate operational problems.

Water that has to be pumped out of any construction area is routed to the existing storm drain system. The storm drain system has two detention basins where solids and large contaminants are settled out before the water is discharged to the bay.

Waste materials from construction would be disposed of as legally required. Raw sewage will be disposed of at the sewage treatment plant.

SECTION IV

Section IV

ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSAL IS IMPLEMENTED

One environmental effect which cannot be avoided is an increase in vehicle traffic on the airport and on the roads leading to the airport.

Vehicular traffic increases and their effect on highway usage were considered in Section II, Paragraphs N.1 and N.2. A possible doubling of passenger vehicle traffic and a slightly lesser gain in airport related truck traffic were reviewed.

It was concluded that since Highway 101 exceeds practical capacity now on occasion, there will be a readjustment of route selection by driver or a lengthening of "peak hour". Traffic engineers throughout the county have observed the phenomenon that "peak hours" get longer when practical capacity is approached or exceeded for any period of time. For internal traffic reference is made to discussion in Section II, Paragraph N.2. There it is noted that public parking spaces will increase from 5219 to 8910 and that total peak hour curb space passenger capacity will double from 3900 to 7800.

An increase in the solid waste generated is unavoidable. Solid waste is expected to increase from 287.3 tons per week to 500 tons per week by 1985. As noted in Section II, Paragraph M.7, the waste will be handled, primarily, in sanitary land fill.

An increase in liquid wastes generated is unavoidable. This increase has been anticipated in the design of the sewage-treatment plant and will be incorporated in the industrial waste-treatment plant. To provide for these wastes, use of water will increase from 1.95 million gallons per day to 5 million gallons per day.

The increase in water, natural gas, electricity, and aviation fuel consumption is unavoidable because these are necessary ingredients for accommodating increased passengers.

	<u>1969</u>	<u>1985</u>
Water (million gallons/day)	1.95	5.0
Natural Gas (million cu. ft. /hour)	0.5	1.3
Peak Electrical Demand (million volt amperes)	18.0 ⁽¹⁾	90.0

(1) 1971 data

SECTION V

Section V

MITIGATION MEASURES PROPOSED TO MINIMIZE THE IMPACT

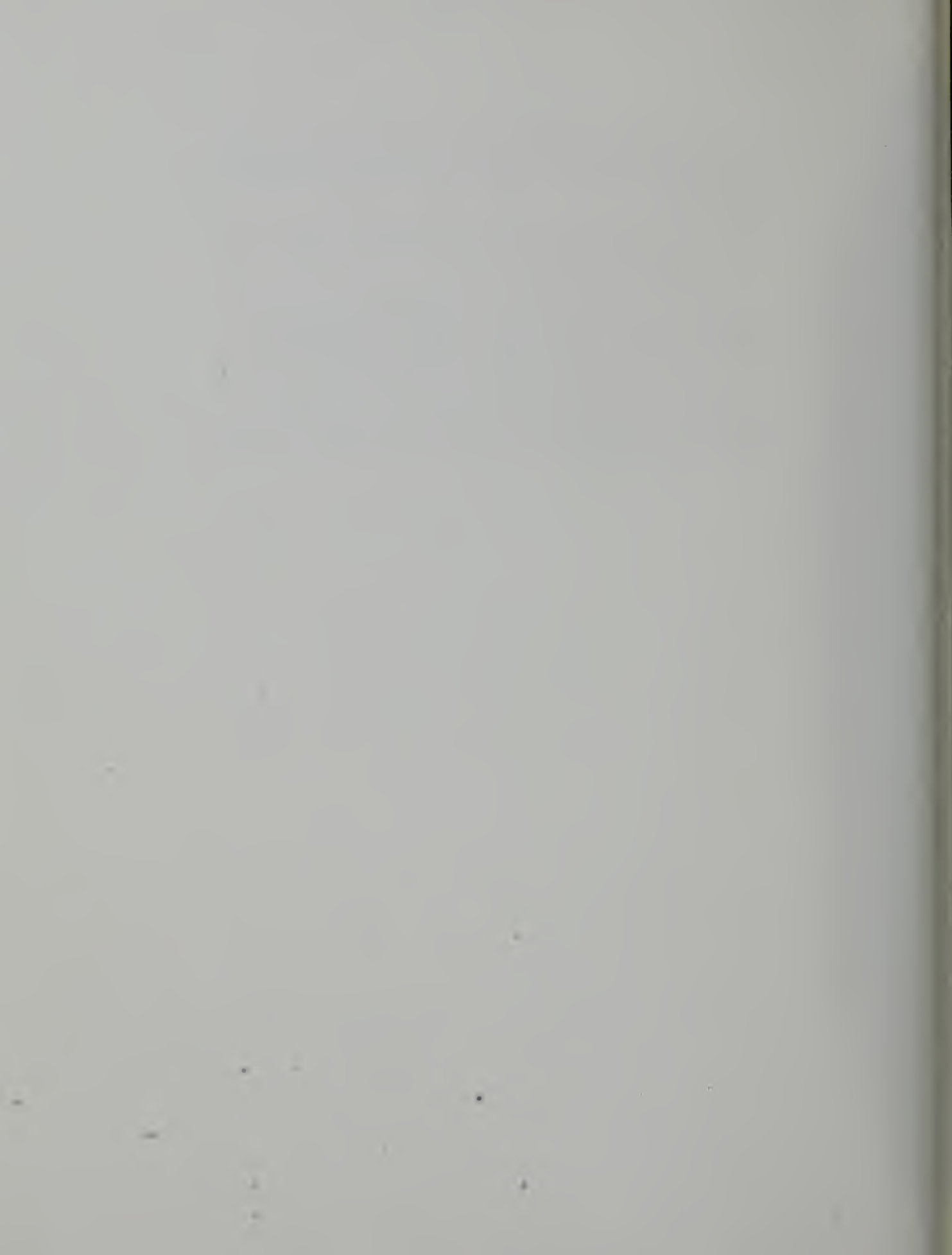
The Regional Airport Systems Study Committee reviewed the overall environmental impact on the San Francisco Bay Area and concluded that expansion at San Francisco International Airport would most effectively mitigate the regional impact, since this Airport is already more accessible than the other area airports and can have an expanded capacity without acquisition of land and a minimum creation of new land areas.

The proposed San Francisco International Airport Expansion Program, in turn, incorporates a number of significant measures to mitigate the impact on the local environment:

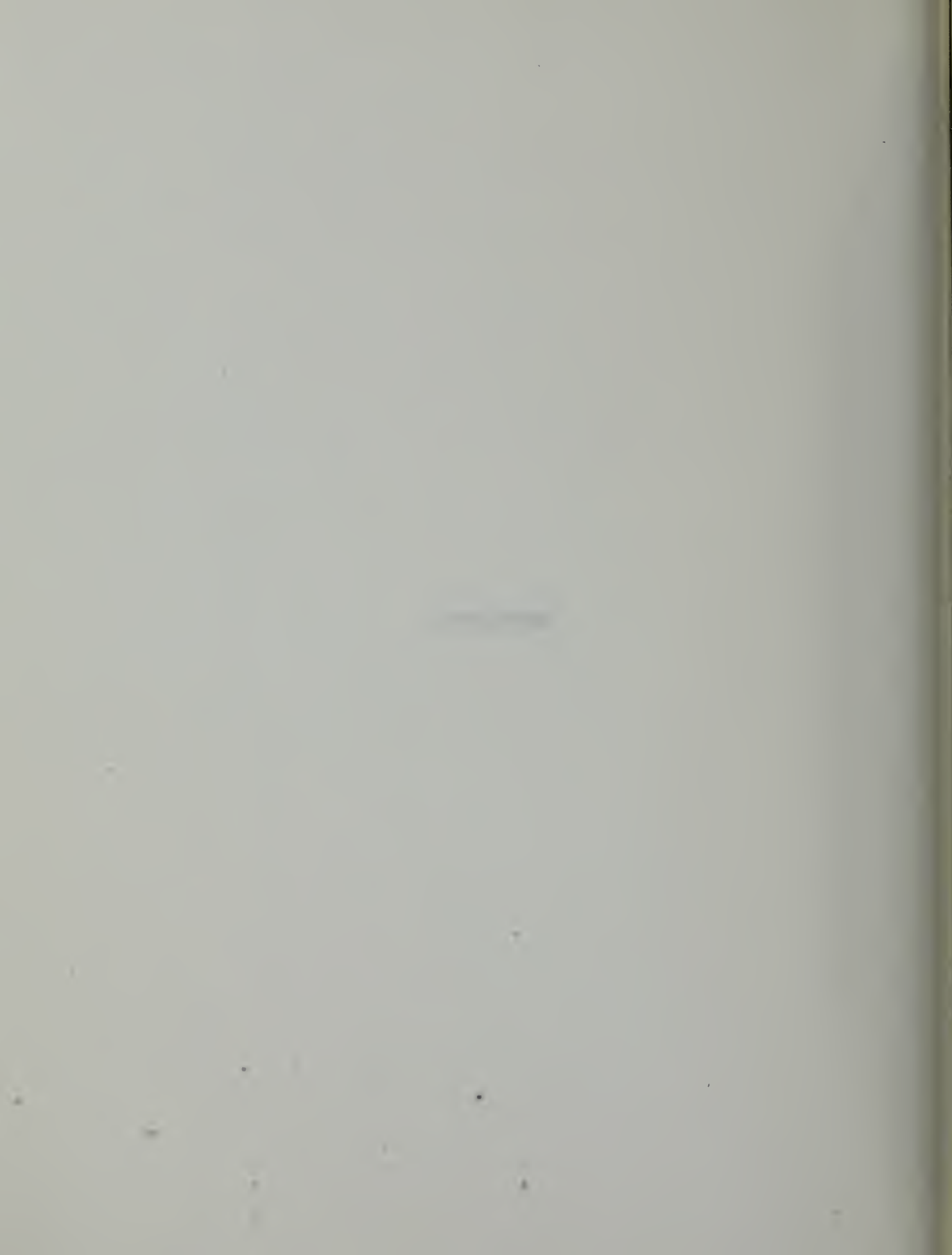
- The Expansion Program has been designed to take place within existing boundaries so that no land acquisition with attendant displacement of people is required.
- The Expansion Program includes facilities that would allow an increased use of the new larger and quieter aircraft. This permits increased passenger traffic without increasing the number of airline operations. This would contribute to reducing noise levels that would otherwise occur.
- The Expansion Program does not include any new runways because the increased passenger traffic can be accommodated by improving the existing runways to allow more use of the larger aircraft. The extension to Runway 28R over existing fill has been included in the Expansion Program to make the take-off threshold for this heavily-used runway more distant from the residential areas under the flight path, thereby permitting improved operations measures and further reducing the noise impact.

- The Expansion Program includes two high-speed exit taxiways which would enable aircraft to leave the runways sooner and at higher speed, thereby allowing them to minimize thrust reversals and still arrive at the loading gates sooner. This would alleviate noise, consume less fuel and, in turn, reduce air pollution.
- The Expansion Program incorporates substantial increases in curbside loading facilities, close-in parking and convenient access and egress for those who choose to use automobiles, so there would be improved passenger convenience and less traffic congestion with its attendant engine-idling for large numbers of automobiles. These improvements would contribute to the reduction of air pollution from automobile emissions.
- Provisions to assist adjacent communities in improving road intersections that join the airport frontage roads have been included in the Expansion Program; improvements to the frontage roads themselves are also included. These improvements would, together with the construction of Interstate 380, help relieve the congestion of the streets of nearby cities.
- The Expansion Program includes facilities for more complete treatment and better handling of both domestic and industrial liquid wastes. These facilities are sized to accommodate the increased quantities anticipated. The projects include a domestic sewage-treatment plant already completed, an industrial waste-treatment plant and collection system, and a joint Airport-South San Francisco deep-water outfall. Therefore the quality of effluent entering the Bay would not only be improved, but would be more effectively dispersed into deeper waters.
- The Expansion Program calls for provision of modern solid waste collection and compaction systems which would minimize the volume of solid waste being disposed off the Airport site.
- The Expansion Program provides for integrated heating, cooling and electrical systems to give more efficient utilization of fuel and power.
- The Expansion Program is under the architectural and aesthetic control of one firm, so a unified visual effect would be achieved. Budgets of \$2,000,000 and \$850,000 have been established for art enrichment and landscaping, respectively.

- A noise-monitoring program is being implemented so that accurate data will be available to describe aircraft noise. This will aid in implementing future noise-reduction programs.
- A pollutant-monitoring system, to check air quality in the vicinity of the Airport as affected by aircraft emissions, is included in the Program.
- The Expansion Program is incorporating structural provision for a possible extension of the Bay Area Rapid Transit (BART) to the Airport. These provisions would make such an extension less costly and less disruptive to on-going operations during construction. If BART is extended to the Airport, it is expected to reduce automobile usage and, hence, reduce the amount of automobile congestion and air pollution.



SECTION VI



Section VI

ALTERNATIVES TO THE PROPOSED PROJECT

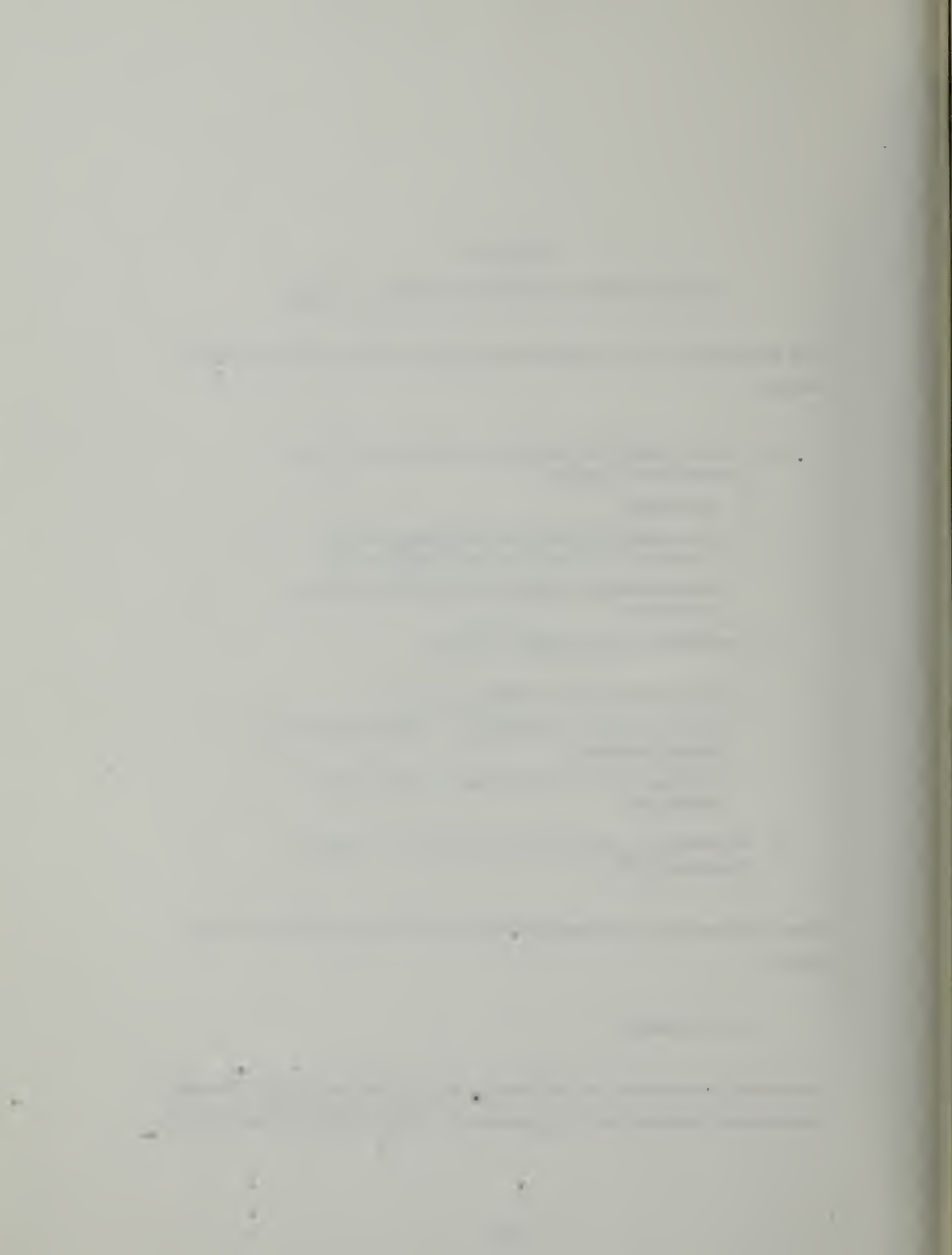
The alternatives to the proposed development which were considered include:

- a. Modify Expansion Program at the San Francisco International Airport
 1. Do nothing
 2. Do nothing except those projects which are mandated by Federal or State Regulation
 3. Revise design standards to conserve energy resources
- b. Use other transportation systems
 1. Use of tracked air cushion vehicles
 2. Use of present rail facilities, with the facilities being upgraded
 3. Develop a short take-off and landing (STOL) capability
- c. Alternatives considered in the Regional Airport Systems Study

These alternatives were reviewed with comments thereon as shown below.

1. Do nothing

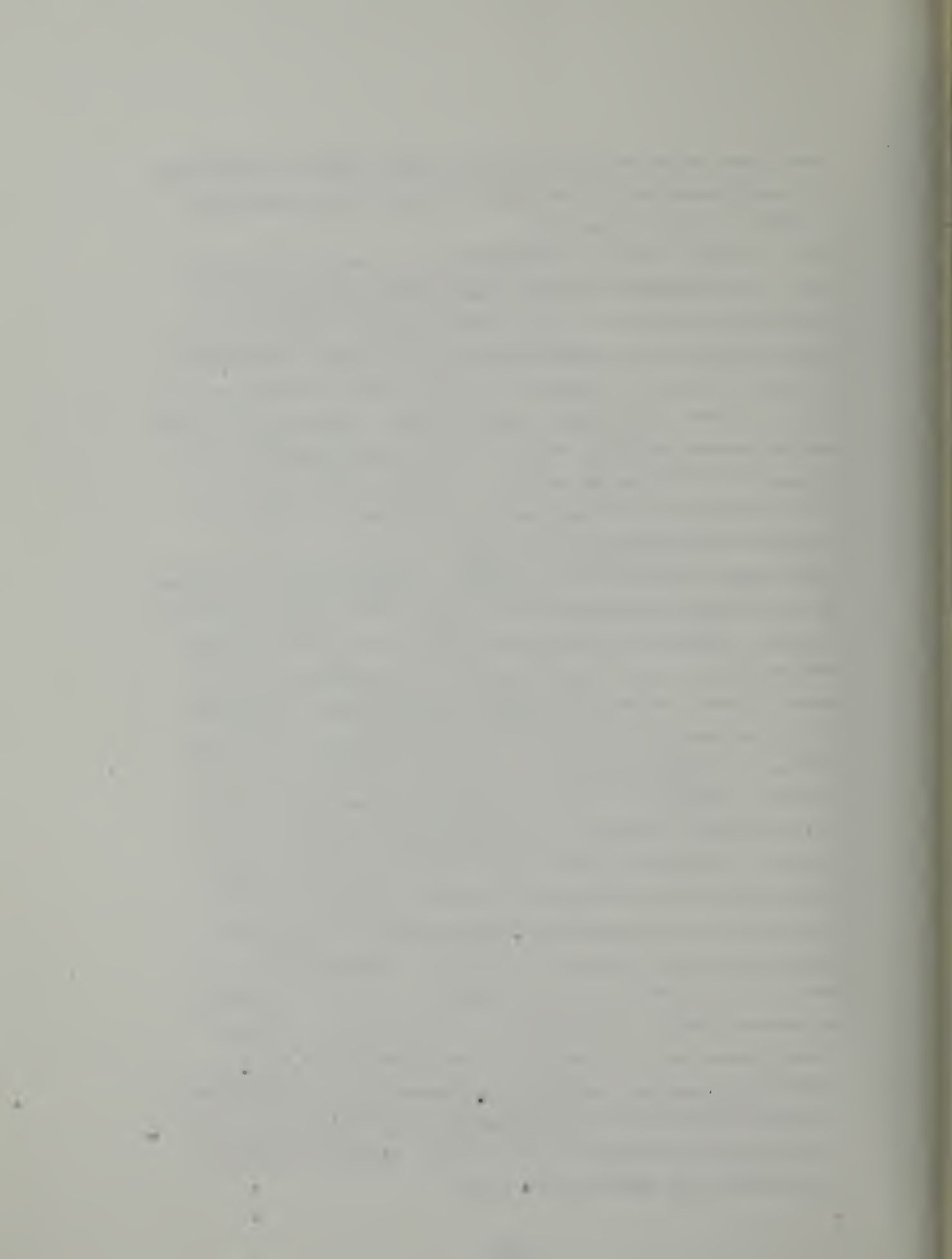
One of the alternatives to the Expansion Program for the San Francisco International Airport is to "do nothing." Doing nothing in this instance



would mean leaving the facilities at the Airport as they are today. This alternative would have the advantage of not requiring a large capital expenditure of funds at this time.

The "do nothing" alternative depends upon any of three basic assumptions. One assumption is that for no population growth or reduced growth there would be no need to expand the present facilities further, since the demand for air transportation at San Francisco International Airport would remain constant at about 15-16 million passengers annually, or increase only slightly, and this number could be accommodated with the present facilities. Secondly, that increased demand for air transportation would not be satisfied. Thirdly, if there were an increased demand for air transportation, it could be satisfied by air transport from another Bay Area airport.

With respect to the first two assumptions, passenger growth is affected by many factors besides population, such as income, employment and tourism. The relationship of air travel passenger growth to population has increased from 2,681,322 in 1950 to 4,628,000 in 1970, or about 1.8 times, while air passengers have gone from 2,000,000 to 17,500,000 in the same period, for an eight-fold increase. Between 1960 and 1970, the statistics are even more startling: with less than a million increase in the Bay Area population, there was an increase of 12,500,000 air passengers. These data indicate that the average person is using air travel more each year. If our society becomes more affluent, this percentage is expected to increase. Also, over 40 percent of the air passengers using San Francisco International Airport at the present time are not residents of the Bay Area but are visiting here on either business or pleasure. This, too, is expected to continue. With no national policy to discourage travel, even with a stable population in the Bay Area, we must anticipate a sizable growth in air passenger demand for transportation. If no provisions are made to handle this increased demand, congestion and inconvenience will result, and these are not currently considered acceptable or desirable by the majority of the public.



The alternative "do nothing" at San Francisco International Airport, if adopted, would have an adverse impact on the environment in the vicinity of the airport from several aspects. Noise and air pollution effects from aircraft would remain as they are now since the quieter cleaner, wide-bodied aircraft cannot be substituted for the noisier, dirtier, smaller aircraft, due to terminal area restrictions. Also the noise impact reduction anticipated from extending runway 28R away from San Bruno would not be realized. With no additional vehicle parking in the area of the terminal, there would be increased congestion, causing slower-moving traffic to burn more fuel with a consequent greater emission of pollutants, although auto traffic would tend to be more discouraged from driving to the Airport.

The third "do nothing" assumption implies that other Bay Area airports would carry the load of the Bay Area traffic over and above the 15-16 million passengers at San Francisco International Airport. The problems of expanding other airports to meet the RASS-recommended loads are even more severe than those facing San Francisco. Ground access to Oakland is more restricted than at San Francisco. Even with San Francisco International Airport expanding to 31 million, in order to meet the forecast needs set out in the approved Bay Area Airport Regional Plan, Oakland International Airport must expand 12 times, and San Jose Airport must expand 5 times their operational capacity; with no expansion at San Francisco, 15 million additional passengers would have to be accommodated. An expansion of this magnitude at Oakland International Airport would require Bay fill to provide for a new runway. San Jose, as documented in the RASS reports, has a more severe air quality problem than San Francisco, as well as a severe noise problem. Agreements have not been reached with the Defense Department which would permit joint military-civilian use of Travis or Hamilton Air Force Base. Neither of these airports has any civilian terminal facilities existing and would require new construction. Napa County Airport is

a general aviation airport and a runway extension would be required in addition to terminal facilities.

2. Do nothing except those projects which are mandated by Federal or State Regulation

This alternative would include those projects providing facilities to improve the quality of the waste water being discharged into the Bay and the project to pave the extension to Runway 28R to lessen the noise impact. Although both of these actions would be beneficial to the environment, the problem of taking care of an additional 15 million passengers per year, with which the Expansion Program was designed to cope, would still exist. Noise and air pollution from the higher percentage of smaller aircraft making up the air fleet using San Francisco would be greater than if the expansion proceeded, permitting more of the quieter and cleaner wide-bodied aircraft to replace the smaller ones. Ground congestion for both aircraft and automobiles at the Airport would be greater, and would result in wasting fuel and producing more emissions while waiting to park. With no provisions to accommodate the forecast passenger growth, congestion and inconvenience would increase.

3. Revise design standards to conserve energy resources

The increase in the use of electrical energy in the planned expansion is due in part to air conditioning loads, automated baggage handling systems, and mechanical systems for moving people within the terminal area. To conserve any substantial amount of electrical energy would require that the standards planned for these items be reduced.

The terminal buildings and boarding areas are in close proximity to the source of noise and pollutant emissions -- the engines of the jet aircraft. To avoid health hazards for the millions of annual passengers and their greeters and well-wishers who use these buildings, it

is necessary to close these irritants outside to the greatest extent possible. Most of the air, 90%, will be recirculated through filters and reused, with only 10% make-up air from outside. Without equipment of sufficient capacity to condition this recirculated air, during peak hours on warm days the heat would build up to the point where it would physically affect the occupants.

Space at the Airport is not sufficient to permit manual handling of baggage, and some mechanical means of performing this function is necessary. Modern automated baggage handling systems are being planned by the airlines to provide faster and better service to their passengers in recovering their baggage. This is sorely needed now and will have even a greater need when larger numbers of passengers disembark from the same plane. However, these baggage systems require large amounts of electrical power. Limited baggage handling systems are possible but they would contribute to the congestion which the planned expansion is attempting to alleviate.

San Francisco International Airport has a very compact terminal area but there are still long distances to be travelled from the outer boarding areas to the garage, other airline boarding areas for transferring passengers, and to the future BART station. Particularly for the handicapped, elderly, people with children, and for those carrying bags, the distances become too great for walking. A people mover system, with associated escalators and elevators, has been planned in the Expansion Program to solve this problem. It is quite possible to reduce or even eliminate such a system but to do so would be a disservice to the travelling public.

b. Use other transportation systems

An alternative to developing the Airport further might be the provision of an alternate means of transportation such as: use of tracked air cushion vehicles, use of upgraded present rail facilities, or operation

of a STOL program. These systems, or combinations thereof, may lower the total demand for air travel by the year 2000 from about 240 million to 150 million annual passengers, but are not considered feasible of accomplishment within the forecast period.

1. Use of tracked air cushion vehicles

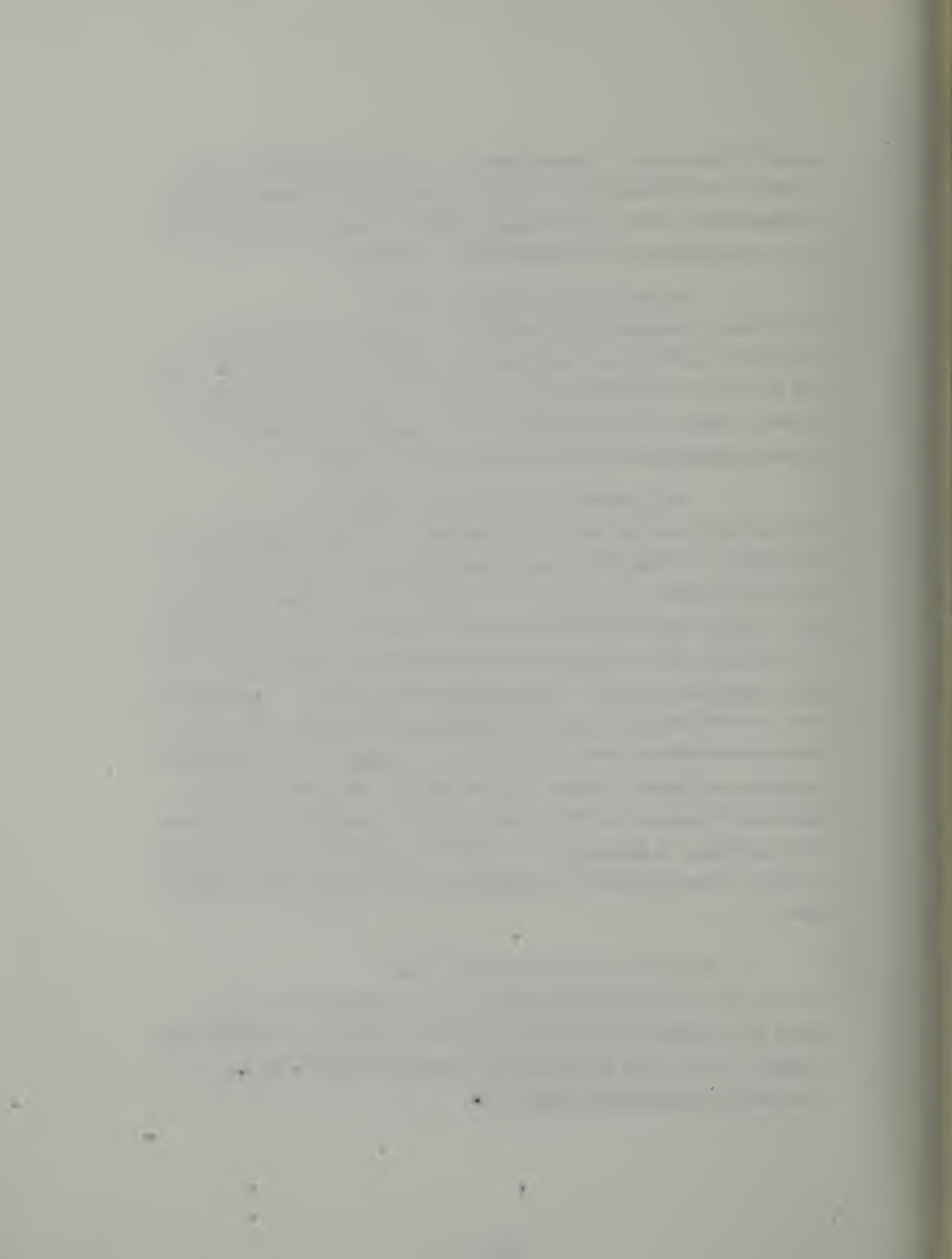
Preliminary findings indicate that the tracked air cushion vehicle is technically possible but would have such high cost that it could not pay for itself and a subsidy would be required. Further, securing rights-of-way, obtaining financing and constructing such a system are so time-consuming that it could not be operable by 1985.

2. Use of present rail facilities, upgraded

One possible solution would be to develop a rail rapid transit system. The logical first leg of this transit would be a line running between the San Francisco area and the Los Angeles area. Present rail facilities could be upgraded with straightening of some curves, and a majority of the rail could be located on existing rights-of-way. This would allow operation of vehicles of up to 130 miles per hour. The improved cars could be designed to perform safely at such speed. The Rand Corporation of Santa Monica, California, is engaged in exploring such a high-speed surface system. The report from this study should be published in October of 1973. Even with the improved speed and minimal upgrading, it appears that a subsidy would still be required. Such a system is not expected to be able to be put into operation until after 1985.

3. Short take-off and landing aircraft

The Regional Airport Systems Study also considered the concept of Short Take-off and Landing (STOL) aircraft. While this system shows promise, it is not yet economically and operationally viable and is not expected to be operational before 1985.



c. Alternatives considered in the Regional Airport Systems Study

Various alternative ways of providing airport facilities to satisfy the projected needs for the Bay Area were investigated in the Regional Airport System Study. Eleven of these alternatives provided for expanding San Francisco and Oakland airports in differing amounts and combining with these expansions either expanding the existing San Jose airport, building new airports, joint-use military airfields, expanding general aviation airfields, or a combination of these. In all eleven alternatives considered, San Francisco International Airport was to expand to take at least 32, 500, 000 annual passengers.

Consideration was also given to the replacement of the three existing Bay Area airports with a regional airport at one of three different locations. These became RASS alternatives 12, 13 and 14.

12. A regional mid-Bay airport with BART connections to replace San Francisco and Oakland. This new airport would have two sets of parallel 12, 000-foot runways over 2, 000 acres of fill. The intention would be to relieve noise impact, improve retail accessibility, and replace separate San Francisco and Oakland Bay fill. San Francisco and Oakland would be used for parking and terminal functions.
13. A new regional airport in eastern Contra Costa County.
14. A new airport in southern Sonoma County (North Bay).

After the RASS reports were published, a number of public meetings were held. The meetings established that the public did not want new airport sites created because of environmental considerations. This eliminated Site E in San Jose, North Bay, and mid-Bay. The eastern Contra Costa County site was eliminated because of the average one-way trip distance of 70 miles.

After considering all of these alternatives, the Regional Airport Systems Study recommended that the airports in the Bay Area be developed to the following annual capacities:

San Francisco	31 million
Oakland	24 million
San Jose	10 million
Travis Air Force Base	6 million
Hamilton/Napa	<u>1 million</u>
Total	72 million

The Regional Airport Systems Study was adopted as a Special Plan Element to the Association's Regional Plan on November 30, 1972. and was accepted by the Metropolitan Transportation Commission as the Regional Transportation Plan's aviation component, to establish a foundation for continuing airport planning and development.

SECTION VII

Section VII

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The short-term uses of the land on which this project is being planned differ only in degree from the long-term uses. The accomplishment of this project would maintain and enhance the long-term productivity of the land by providing facilities which can accommodate twice the present passenger load.

With the exception of one strip of land located between Bayshore Freeway and the Southern Pacific Railroad, which, due to lack of suitable access, is unused now except for an electrical substation, the land for this project is in active use in support of an operating airport. The project which is proposed would be carried out entirely within the present boundaries. Primarily the project modifies present terminal buildings, replaces existing boarding areas, and adds additional passenger terminal facilities -- all designed to accommodate the modern wide-bodied aircraft which carry substantially greater numbers of passenger per plane. This permits more efficient use of the land, satisfying a forecast requirement of twice the present use, without the need for additional acreage.

The planned expansion is anticipated to satisfy demands for passenger travel through 1985. It is quite possible that shortly thereafter travel demands will increase beyond the capacity which this expansion would accommodate. It is not planned to expand the San Francisco International Airport beyond the 31 million capacity. By that time, the studies which are now being made for rapid transit corridors between San

Francisco and Los Angeles, and between San Francisco and Sacramento, may have become realities, in which case the increased demand for long route air travel could be offset by reductions on the short routes. By that time period also, the STOL/VSTOL aircraft may be developed to the point where these can be economically operated along the short routes. In any event, for the foreseeable future, the facilities in this project will be needed for the accommodation of air travellers, and by filling this need would enhance the long-term productivity of the land.

The number of aircraft operations being planned for in this project is approximately the same as at present, although the airplane type mix is quite different. Both noise and air pollution in 1985 are forecast by specialists in these fields to be lower than those experienced now. This should enhance the environment while making the use of the land more productive. Monitoring systems of both air and noise pollution are included in the Program to see that it does.

With the number of air passengers doubling, the number of vehicles travelling to and from the Airport would increase nearly twofold. Because of the laws which are now being applied to auto and truck emissions, the total emissions from these vehicles are expected to be less than 25% of those at present. To further reduce the adverse impacts of so many vehicles, the Airports Commission has included in the Program provisions for bringing BART thru the Airport if it is extended south on the Peninsula. Such a transit system would not only reduce the vehicles on the Airport but, more important, would reduce the congestion on Route 101 caused by commuters.

SECTION VIII

Section VIII

ANY IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION, SHOULD IT BE IMPLEMENTED

Implementation of the expansion program would require the expenditure of the following resources:

- Construction material for buildings and pavement
- Construction material for building furnishings
- Energy supplies for heating and cooling buildings
- Manpower for construction
- Commitment of capital

Economic and social benefits must be considered to determine if the long-range gains to the political, social, economic and ecological whole are of sufficient advantage to justify the project.

Part of this review is the consideration of the expenditure of the resources listed above. In order to put this in perspective, it is appropriate to see what portion the use of these resources amounts to in the project area, compared with other public works.

To compare the expenditure of resources on the project with annual expenditures of such resources in San Francisco and San Mateo Counties and in the State of California, 1970 data have been reviewed. San Mateo County figures are included since the San Francisco International Airport is located within that county. It is noted that the project's construction period is expected to be 10 years, so totals are shown on an average for one year.

The average annual cement use would amount to 18 percent of the two counties' 1970 usage and 1.2 percent of the State's 1970 usage.

The average annual amount of sand, gravel and stone estimated for the airport expansion would represent 2.7 percent of the 1970 use in the two counties, and 0.08 percent of the State's 1970 usage.

Steel would represent 7 percent of the two counties' and 0.4 percent of the State's 1970 use.

Estimated Consumption of Selected Construction Materials

	Estimated Average Annual Demand for 10 yr Project	San Francisco	San Mateo	California
	in thousands			
Cement, Tons	11.7	40	24	947
Sand & Gravel, Tons	107.7	2,460	1,485	140,259
Stone, Tons	53.0	2,550	1,102	46,399
Construction Steel, Tons	4.3	44	19	1,035
	Cost Reference (in thousands)			
Annual Value of Construction	\$31,800	\$238,366	\$143,346	\$5,721,189

Notes: Tonnage figures -- from the Minerals Yearbook of the Department of the Interior. Where data were not given, these were estimated based on construction ratios of the counties to the State.

Value of construction -- California State Chamber of Commerce -- Economic Indexes -- Building Permits

Not all of the buildings for which permits are obtained are built in any given year. Some may not be built at all, and some will cost more or less than estimated. The building permits tabulation is, however, an excellent indicator of what is built in the location shown, as well as the general costs thereof. The average annual figure is used for comparative purposes only as in some years, airport construction materials would be above the average and in some years below the average.

The Expansion Program would provide a more efficient heating and cooling system, but the net result is an increase in energy expenditure over the existing terminal buildings.

The value of labor in total construction cost in the San Francisco Bay Area ranges from 30 to 45 percent. The reason for this spread depends on whether the type of construction is labor or equipment intensive. For a building which has a relatively high labor component, labor would tend to constitute about 45 percent of the total construction cost. For an earthmoving job, runway or other equipment intensive project, the labor component would be about 30 percent of the total job. These percentages would provide an average of 670 construction people working for the duration of the expansion program.

With respect to the annual outlays of money shown above, the funds shown for the Counties and the State are for public projects funded mainly from tax revenues, and private projects. The funds to be used for the Airport expansion are to be primarily from General Obligation or Revenue bonds which would be repaid in their entirety from revenues from the airport's operation. In view of this, these funds would not be available for other purposes.

SECTION IX

Section IX

THE GROWTH-INDUCING IMPACT OF THE PROPOSED ACTION

The proposed Expansion Program is to provide the facilities needed to accommodate in an efficient and convenient manner the number of air passengers forecast for San Francisco International Airport through 1985. Of the projected 1985 air-passenger demand in the Bay Area, San Francisco International Airport is being designed to handle less than 30 percent of the increase. This increase in capacity, would double the present usage of San Francisco International, and would induce population and employment growth in the immediate vicinity.

There would be an increase of employees at the Airport, on a long-term basis, to operate and maintain the enlarged facilities and to take care of the greater number of air passengers. However, the project would not have the growth-inducing impact on the surrounding communities that a new airport would have on a region. San Francisco International Airport has been operating since 1927 and the airport-associated industries which would normally seek to be near a major airport are already largely located in the vicinity of the airport. Due to the greater number of passengers using the airport, there would be an increase in those commercial activities which are related to personnel, such as hotels, restaurants, etc. The City of San Francisco, especially in its Yerba Buena Center project, is providing many of the commercial activities which would be required by this expansion; consequently commercial growth in the immediate vicinity of the Airport could be restricted by the local planning commissions without undue problems to the Bay Area visitors.

CHAPTER IV

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and development. It begins with the first settlers who came to the continent in search of a new home. These settlers found a land of vast resources and potential, but they also found a land that was already inhabited by a diverse and complex society of Native Americans. The story of the United States is a story of the struggle to create a new society, a society that would be based on the principles of liberty and justice for all.

The story of the United States is a story of the struggle to create a new society, a society that would be based on the principles of liberty and justice for all. It is a story of the struggle to overcome the challenges of a new world, a world that was full of opportunity but also full of danger. The story of the United States is a story of the struggle to create a new society, a society that would be based on the principles of liberty and justice for all. It is a story of the struggle to overcome the challenges of a new world, a world that was full of opportunity but also full of danger.

Basic employees are expected to increase by 13,655 by 1985. This estimate includes those individuals employed by the Airport, airlines, hotels and Federal Government agencies associated with air transportation.

SECONDARY IMPACT

A secondary impact is a result of a primary impact of an action. The basic industries employment increase of 13,655 is expected to cause increases in "population-serving" industries such as banks, restaurants, insurance, retail sales, etc.

The secondary impact of airport expansion was studied at some length by Goldner and others at the Institute of Transportation and Traffic Engineering (ITTE) of the University of California, Berkeley, in 1971. The report, "Economic and Spatial Impacts of Alternative Airport Sizes and Locations in the San Francisco Bay Region," which was prepared for the Association of Bay Area Governments (ABAG), was a result of those studies. The report indicates that in 1980, for the larger counties in the Bay Area, there will be 1.25 population-serving employees for each basic employee. If this ratio holds true for later years, the 13,655 basic employees would create employment for 17,100 population-serving employees. This 30,755 total increase would be 11.2 percent of the projected 260,000 employment in San Mateo County in 1985, and 1.2 percent of the nine-county projected 2,473,000 employment in 1985.

Although the program adopted by ABAG differed from the alternatives studied by Goldner, et al, several alternatives are sufficiently close for realistic comparisons; these are shown in the table below.

Table 9-1
 ALTERNATIVE AIRPORT SYSTEMS:
 ESTIMATES OF ANNUAL PASSENGERS DURING 1985*

(Thousands)

Airport Location	Alternative Airport Plans					Final Estimate
	1	4	8	9	10	
San Francisco	32,650	32,650	32,650	32,650	32,650	31,000
Oakland	34,314	17,000	13,780	43,314	24,100	24,000
San Jose	16,500	7,500	7,500	7,500	16,500	10,000
Hollister			26,845			
Travis		26,314				6,000
Napa			2,689			1,000
Total	83,464	83,464	83,464	83,464	83,464	72,000

Secondary impacts of ten demographic social and economic features were reviewed in conjunction with the several alternatives shown above as they relate to San Mateo County. Table 9-2 shows a range of expected impact results with an indication of the most probable for the final estimate.

It is noted from Table 9-2 that the range in the several indices is as much as 100 percent in the case of non-residential land acreage change. This is a result of the extremely small base for the estimate. Of the other nine items, the range is from 0.3 percent to 17.1 percent. A statistical assessment of the 31,000,000 vs 32,500,000 total forecast passengers for San Francisco has been made to arrive at a probable figure for each of the indices. It will be noted that these probable figures most nearly correspond to alternative 10.

* Goldner et al. Economic and Spatial Impact of Alternative Airport Locations, Regional Airport Systems Study, Volumes 1 and 2, ABAG, July 1971

Table 9-2

ESTIMATED CHANGES FOR DIFFERENT AIRPORT ALTERNATIVES
SAN MATEO COUNTY

	Alternative Airport Plans					<u>Range</u>	<u>Probable</u>
	1	4	8	9	10		
Population (000)	49.9	44.3	42.9	49.9	48.4	42.9 to 49.9	49.0
Dwelling Units (000)	16.3	14.6	14.1	16.3	15.9	14.1 to 16.3	16.1
Average Household Income \$(000)	14.82	14.79	14.78	14.82	14.81	14.78 to 14.82	14.81
Aggregate Household Income \$(millions)	267.50	237.71	220.67	266.83	259.56	229.67 to 267.50	264.00
Residential Land Acreage (000)	4.3	3.9	3.8	4.3	4.2	3.8 to 4.3	4.2
Non-residential Land Acreage (000)	.2	.1	.1	.2	.2	.1 to .2	.2
TAXES							
General Sales Tax \$(millions)	4.1	3.6	3.5	4.1	3.9	3.5 to 4.1	4.1
Federal Income \$(millions)	87.9	77.9	75.2	87.6	85.3	75.2 to 87.9	87.3
State Income \$(millions)	17.2	15.2	14.7	17.1	16.7	14.7 to 17.2	17.1
Property Tax \$(millions)	17.2	15.7	15.2	17.6	17.1	15.2 to 17.7	17.5

Source: Goldner et al.

The results to be expected in 1985 cannot be forecast with complete accuracy, but the range secured from the Goldner report is reasonable and the weighted answer shown as probable in the table may be expected reasonably to occur.

It is anticipated that utilities would be concerned with increased demand for services. General estimates of new demand have been made for electricity, gas (for both heating and cooking), and water and sewerage needs. With the estimated "probable" addition of 49,000 people who would need 16,100 dwelling units, as the result of the airport program, there would be the concomitant needs for utility expansion. Using factors developed

by PG&E for San Mateo County for present conditions, it is estimated that in 1985 there would be 81,546,000 KWH per year of electricity and 20,370 therms of gas required.

In addition, there would be the need for 6.4 millions of gallons of water per day. This is estimated from the current average usage in the area of 130 gallons per day per person. Based on the present factor of 90 percent, there would be 5.7 million gallons per day added to the sewerage system load.

These utility estimates represent about 8.8 percent growth over the 1970 demand and are based on 1970 per capita utility consumption figures. These figures do not include any airport-increased utility demands.

It is estimated that there would be 4,200 acres of residential land required in San Mateo county for this increased population and 200 acres of non-residential area for the industrial and commercial growth. Property taxes resulting from this increase are estimated to be \$17,500,000 per year, general sales tax \$4,100,000, and State income tax \$17,100,000.

If this population increase over the next ten years is distributed proportionally over the County, there would be an insignificant effect on the services required (such as police, fire departments, schools, water supply, sewage systems, etc.) However, if a large portion is attracted to one or two communities, there could be substantial effects.

SECTION X

Section X

EIR AUTHORS AND CONSULTANTS

The bibliography lists many of the reports and consultants who prepared these reports either for RASS studies or under direct contract to San Francisco International Airport.

Bay Area Air Pollution Control District	Air Quality
R. W. Beck and Associates	Electrical Demand
Bolt, Beranek and Newman	Noise
Dygert and Ungerer	Airport Noise and Land Use
Gillfillan, Walter E.	Airport System Plan
Goldner	Airport Economic Effects
Metcalf and Eddy	Water, Sewerage, Drainage, Gas & Solid Waste Data
Wilbur Smith and Associates	Vehicular Traffic
R. Dixon Speas Associates	Airspace Capacity
Systems Analysis and Research Corp.	Aviation Forecasts
Wilsey and Ham	Physical Environment

The following organizations provided valuable data for the final report:

State Division of Highways

Association of Bay Area Governments

Metropolitan Transportation Commission

The San Francisco International Airport staff and Bechtel Incorporated compiled the information based upon the sources above. The report was prepared by the San Francisco Department of City Planning.

SECTION XI

Section XI

WATER QUALITY ASPECTS

No previous airport expansion projects have been certified as being in substantial compliance with applicable water quality standards. Certification is required for new water projects begun after April 16, 1973.

Water quality is referred to briefly in Section III, Paragraph J2, and in Appendix H.

SECTION XII

Section XII

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Metcalf and Eddy, Additions and Improvements to the Water, Sewerage, Drainage, and Gas Systems for San Francisco International Airport, December 1970

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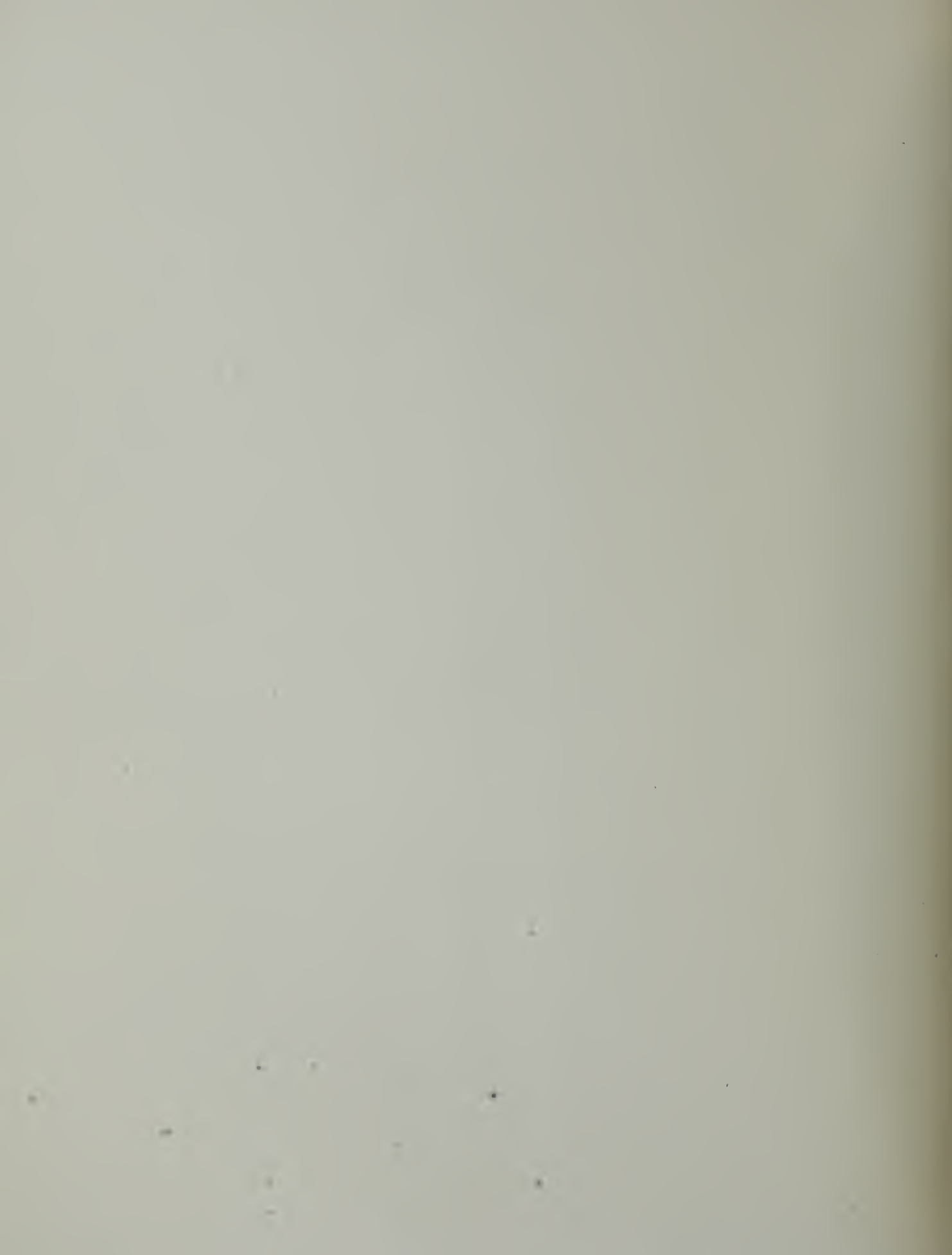
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R. Dixon Speas Associates, Airport and Airspace Capacity Analysis Regional Airport Systems Study, Phase II, ABAG, September 1971, and Airport Noise Reduction Forecast Program DOT-OS-20088, in progress.

Systems Analysis and Research Corporation, Aviation Forecast, Bay Area Study of Aviation Requirements, ABAG, May 1970

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SAN FRANCISCO INTERNATIONAL AIRPORT

ENVIRONMENTAL IMPACT REPORT FIGURE 1-1

